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ANTHONY'S

Photographic Bulletin.

VOLUME XXII.

1891.

EDITORS:

Prof. CHARLES F. CHANDLER, Ph.D., LL.D.

ARTHUR H. ELLIOTT, Ph.D., F.C.S.

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THE LATEST, BY

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ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. JANUARY 10, 1891. No. 1.

PHOTOGRAPHIC BREAD WINNERS.

In looking through the literature of various arts, sciences and handicrafts, we are constantly called upon to consider them as separate realms or worlds of human activity; and photography has lately become of such supreme importance to mankind, that it also has a distinct realm of its own. Until we pause to consider how far-reaching its effects are upon the life of the rest of the human family, we cannot fully realize the many ways in which it has entirely changed or at least modified the course of modern events. It is only about a dozen years ago that this revival of photographic interest began to be felt, and at that time probably not over ten thousand people in the United States were either directly or indirectly interested in photographic methods. To-day there are probably forty thousand men, women and children whose daily bread is derived from some occupation that depends upon the action of the sun upon a light-sensitive compound.

In addition to these people, who may be called the industrial section of the photographic world, there are also those who, for pleasure and other kindred interests, consume the products produced : the great army of amateurs, that probably number fifteen or twenty thousand.

In the industrial section we have those who supply the instruments and apparatus with which the work of photography is accomplished. In this department the vegetable kingdom is ransacked for its choicest woods. These are carefully selected and fashioned into shape by the most skillful cabinet makers, and with far greater care than would at first appear upon examining a modern camera box, tripod, or plate holder. The best work done in this department of industrial manufacture rivals in exactness and beauty of finish the most skillful results in the finest cabinet work of modern times. And to-day there are perhaps a thousand men skilled in the work. Twelve years ago, probably fifty such men would have been difficult to find in the United States.

Next to the wood-work of the camera and its appurtenances, the brass fittings are of great importance. Here again the skill of the best machinists and the selection of the most desirable qualities of metal are particularly necessary. To

have the metallic surfaces run smoothly over one another; to have the various fastenings unite and hold the wood-work in exactly the right place, is a matter of the utmost importance in fine photographic apparatus. Smooth and handsome finish of the brass fittings also adds very materially to the appearance of the apparatus. Rough screws and carelessly fitted catches are not endurable.

The production of the various shutters and exposers, also calls forth skill and ingenuity in brass-work that approaches the highest attainments. All such work needs the best machinists obtainable.

Yet another and perhaps the most important application of human skill in photography is the production of the little piece of glass called the lens. It is hard to realize how much depends upon the skill of the lens-maker in making a good photograph. The curious combination of silica, lead, lime and soda or potash, that we call glass, has to be selected with the greatest care. The glass-makers' skill reaches its highest achievements in the production of optical glass suited to the best lenses for photographic purposes. And the best efforts of eye and hand are called for in the optician, in shaping the glasses into forms that shall faithfully render upon the sensitive plate an accurate image of the object placed in front of the camera.

By far the greater part of the glass used for this purpose comes from Europe, from the skilled workers of the factories of England, France and Germany; but much of the optical work is done in the United States. In skilled photographic opticians, there are to-day ten where but a few years ago one was to be found.

In addition to the above important skilled workers necessary for the production of the camera and its attachments, we must remember the potter making the porcelain trays, the rubber manufacturer, and the enameled iron-worker ministering to our wants in similar ways. The chemical manufacturer also must enlarge his factory and change his processes to give us new chemicals and more of them as our demands increase. The paper-worker finds we need more paper and card stock, and that these call for special care and the best machinery. Gelatine that formerly was made only to serve the wants of the housewife, has now to be made by tons instead of pounds and of the purest qualities. Nitrate of silver, once used by the hundred pounds is now manufactured into dry plates using tons. Glass plates formerly coated with collodion and sensitized by the individual photographer are now used in such quantities that half a dozen large factories are employed making dry plates, the glass alone used in one of them costing over one thousand dollars a month.

Then we have the background artists, some of them men of more than ordinary artistic ability; also the manufacturers of special furniture and accessories for the studio, industries growing larger and more important every year, and employing large numbers of people in new applications of materials to the special needs of photography.

Among those who are the users and consumers of the materials made by the above workers and not including the amateurs, are those who produce albumen prints of celebrated people, actresses and other prominent men and women, either for sale or as illustrations for books and magazines. To obtain the best results in this kind of work needs skillful operators, the best retouchers, careful and thoroughly experienced printers, and mounters who place the prints on the cards in an artistic manner. It is difficult to say how many people are employed in this kind of work, but probably from four to five thousand. Landscape

photography is also an important feature of this phase of the art. Lantern slides and stereoscopic pictures are another important addition.

At this point we are reminded of a curious fact, the survival of the ferrotype. In spite of all the skill displayed in dry plates, the ease of manipulation, and the cheapness of production, they have not yet been able to completely displace the ferrotype picture, and to-day there are three or four thousand men making ferrotypes in the United States. This involves the production of considerable collodion, and not an unimportant amount of varnish of the older kinds.

What we have recalled above applies to purely photographic work in the production of pictures, negatives or positives, directly by the use of the camera and sensitive plate. Let us now consider the application of photography in the sphere of book and newspaper illustration. The usurpation of the realm of the wood-cutter by the use of the photo-engraved plate has opened up a field of work for photography that is only now in its infancy although ten or more years old. A daily paper with a picture in it made from a pen and ink drawing sketched at some fire or other incident only six or eight hours before its appearance in the newspaper is an everyday exhibit. Yet this would be impossible without photography and its best appliances at the newspaper office. That sketch in ink has to be made by one who is educated to the work and who appreciates the needs of the photographer. Hence photography is rapidly bringing into existence a new class of artists who are fitting their productions to the exigencies of photographic manipulations. Such sketches are rough, but striking and effective, and tell at a glance far more than a column of type by the older methods of journalism. The reproduction of finer drawings, and even painting, in black and white or other monochrome, is now possible and an everyday accomplishment of photography by means of photo-gravure and photo-etching. These applications of the art have to a large extent superseded the work of the steel and copper-plate engraver, and when carefully done are more faithful to the original work of the artist. The better class of our monthly and many of our weekly magazines are illustrated by photo-mechanical methods, and the time is fast approaching when the copper or steel engraved plate will be a curiosity in our museums; for the artists are modifying the methods of drawing to suit the reproductive processes of photography. The recent photo-mechanical exhibition in New York showed how important this application of photography had become. Large establishments, employing hundreds of people, exist in every important city in the United States, where photographic printing methods are employed to illustrate books, magazines and newspapers; and all this in a manner and with a faithfulness never dreamed of in the days of our boyhood. These photo-mechanical plates, like those of the engraver, are also as readily electrotyped, and the rapid increase in the demand for them has stimulated the work of the electrician, so that to-day dynamo-electric machines are made for the special needs of the electrotyper, in order that he may meet the greater demand made upon him, and where formerly he used the chemical galvanic battery.

Photography also threatens to revolutionize the production of books. That enormous mass of typesetting the "Encyclopedia Brittanica," has recently been reproduced, page by page, by photography; and the marvelous feat has been accomplished of reproducing a book at less than one-twelfth of the cost of the original typesetting, and without setting a type. This has been done, not by the

older methods of photo-lithography, but by the action of light on bichromated gelatine under a photographic negative. The time is coming when special type-writers will furnish copy to the photographer, who will make a negative for the photo-mechanical printer, who in turn will make one or more relief plates ready to go into the steam printing press, not a single line of the ordinary printers' type being set.

Such then are some of the phases of life modified and even created through the action of light upon the sensitive photographic plate. These are the growth of but a dozen years. What may we not hope for in the future ?

EDITORIAL NOTES.

An interesting novelty has recently been produced by a Prussian firm, in the shape of dry plates made upon mica instead of glass. This substance, so far as it has been used, appears to answer all purposes required admirably. It is extremely light in weight, perfectly transparent, and so thin as to readily print from the back of plate; showing no tendency to curl up during development, but remaining in a perfectly flat state through all stages of developing. This discovery will be watched with interest by all interested in photography.

We learn that a photographer of Sioux City, Iowa, came very near being blown up with some flash-light compound, which he was in the act of pouring from a bottle held in the hand, unto a flaming bunch of cotton. The flame followed the stream of powder until it reached the source of supply, when all exploded, doing much damage. This serves as another reminder that the compounds of magnesium must be handled with great care. The pure magnesium powder alone will never give any such trouble if properly handled.

In the early part of this month a most enjoyable lecture was given before the State Normal College, in Albany, by Dr. Samuel B. Ward, one of the most prominent members of the Albany Camera Club, in which he spoke of photography from its discovery, outlining the advances step by step. At the close of the lecture a lantern slide exhibition was given, which finished an evening of pleasure and profit to all who were present.

The subject of platinum is still being actively investigated in many directions with a view to increasing the supply. A Russian paper lately published claims that this metal is found in no other part of the world than the Ural Mountains, which statement, however, is hardly accurate, as a much less quantity is there mined than is actually consumed. All that is mined in the Ural Mountains goes to a large English firm, who, judging from the prices paid for it, must be realizing very handsomely from its sale.

The California Camera Club have instituted some important changes in their organization to meet the rapidly growing demands of the times, one of which is to admit army and navy officers and officers of the United States Scientific Corps to the facilities of the club without payment of initiation fee. This action was due to the fact that these officers cannot justly be required to pay full dues owing to their short terms of service in the city. A plan was also

adopted by which a subscription membership is to be formed, and which is to be limited to two hundred members. Owing to unexpected delays the new rooms of the club will not be ready for occupancy before next month.

It is known that silver nitrate may be reduced by the oil of bitter almonds, under a variety of conditions. The conclusion drawn is that after reduction the benzoyl hydride passes into benzoic acid.

Through the courtesy of the New York Camera Club, the fine collection of prints, representative of the various reproductive processes, which attracted so much attention at their rooms in November, has been sent to Boston and placed on exhibition at the rooms of the Boston Camera Club, where the works are receiving no small amount of praise. This exhibition is the second only, of its kind which has been attempted, but it will probably not be the last. There seems to be no better way than this, to demonstrate the importance of photography, which is the basis of manufacturing enterprise in the many directions here shown.

Many experiments have been made with hydro-sulphite of soda as a developer. Where the zinc filings are added to the bisulphite of soda, the oxidation is so rapid that the solution must be used at once, to be available. M. Jules Breton, however, prefers to produce the chemical change as he goes on with development; he places a zinc plate at the bottom of his bath and surrounds the gelatine plate with a rim of zinc, pouring over the whole a weak solution of bisulphite of soda. The negatives thus developed, are of a fine black color when correctly timed in development, but when too long in the developer, take a yellow color, which, however, may be somewhat reduced by immersion in an alum bath.

The Hartford Camera Club are perfecting arrangements for a coming exhibition of photographs by amateurs, in which work of all classes will be received. This exhibition will probably occur in February, from 2d to 7th inclusive, and much interest is being manifested by members of the club. The Committee on Prizes consists of Dr. George L. Parmele, Chairman ; Edward H. Crowell, Charles R. Nason, Fred. D. Berry, Arthur R. Thompson, C. S. Shumway, O. H. Ham, J. Coolidge Hills, Albert H. Pitkin and Elmer M. White.

It is astonishing to note the amount of assistance which the working photographer may bring to his aid by the judicious use of the "make-up box;" by darkening the eye-lashes and accentuating the lines of the eye, with a softly blended shadow, touching the lips carefully where the lines require strengthening, heightening a high light here and subduing another there, but remembering all the while, that the direction and intensity of the proposed lighting and the pose itself must be the guide to the extent and position of this "making-up." Many a worker who tries it for the first time, will get an idea of how much may be derived from its proper use.

Two new methods of intensification come to us from the other side. Dr. Liesegang suggests immersing a negative, which has previously been dried, again in water, when the image will appear in relief, which relief will remain

after again drying. When dry, a second time, roll it up with an easily-drying ink, either red or black, which will adhere to the darkest parts of the image, now in low relief, more quickly than to the high lights, and the result will be a very strong intensification. Another method is described by Dr. Stolze, in which the negative is treated for a minute with bichromate of potassium, a 4 per cent. solution; after drying it is exposed through the back for a considerable time and then thoroughly washed and dried again. The negative is then placed in a bath of water strongly charged with India ink, when the unexposed or soluble parts of the film will absorb the ink, and become thereby stronger, while the exposed or hardened parts of the film will not be affected. This method is said to work very satisfactorily where only a slight intensification is required.

We are not surprised to know that photographers are begining to object to the method in vogue among the ladies, of building up their shoulder-puffs to the extent which now prevails. A prominent operator in this city, claims that he has been compelled to attribute to this cause, several failures to produce satisfactory results, and that only after repeated attempts, did he finally succeed in locating the difficulty where it belonged. Then, by using a scarf and confining the puffs, his first effort was a success. His experience may be of value to others who have had trouble in bringing the lower parts of the face and chin into clear relief.

The New Orleans Camera Club is fortunate in possessing such fine and attractive quarters as it does. The rooms are located on the second and third floors of No. 3 Carondelet street, and consist of assembly room, work room, dark room and dressing room; the work room, or studio, having a large skylight and three very large windows. The club is splendidly equipped with apparatus and material for all branches of its work, and is in a most healthy and flourishing condition.

Members of the Young Men's Christian Association, of this city, are about to have an opportunity to indulge in photography, as the management are about to fit up dark rooms on the top floor of the building. There is also a chance that photography may be made part of the course of study during the remainder of the year. The large hall of the association is admirably adapted to lantern slide exhibitions.

A combined developer of pyro and hydroquinone is recommended by Dr. C. Schleussner, of Germany, made as follows, which is said to give fine results:

Solution A.

Hydroquinone	20 grams.
Distilled water	2000 c.c.

Solution B.

Carb. of potassium	100 grams.
Distilled water	500 c.c.

Solution C.

Distilled water	400 c.c.
Sodium sulphite	60 grams.
Diluted sulphuric acid	10 to 20 drops.
Pyrogallol	20 grams.

For use, combine 40 parts of solution A, with 10 parts each of solutions B and C, starting development with an old mixture, replacing it by fresh, as development proceeds.

The Albany Camera Club have taken possession of their new quarters, and are justly proud of them and the many conveniences they contain. The rooms are all lighted by electricity, and are spacious, convenient and beautiful; they are finely equipped with apparatus, and the dark room is said to be one of the best in the State. One wall of the main room is hung with heavy curtains, which, being drawn aside, reveal a beautiful white surface for lantern work, thus doing away with the bothersome white screen which is always in the way. It is the purpose to make the club of a social, as well as photographic nature, and everything has been done in the arrangement of the rooms to serve this double purpose.

A permanent International Exhibition of Manufactures, Arts and Sciences, is shortly to be opened in Moscow on a large scale, at which quite a space will be occupied by goods pertaining to photography.

[*From our Special Correspondent.*]

ENGLISH NOTES.

By the time these words meet the eyes of the readers of the Bulletin, we shall have entered upon the last decade of the nineteenth century. What improvements may be witnessed in photography before its close? Looking at the present state of things, it appears to us that the day of great discoveries is over—at least for the time—and that the practical work of the next few years will be mainly in the perfecting of details. Of photography in natural colors I have no hope, and I believe that if we get it, most people would be disappointed with the results. The colors on canvas, which an artist puts there, are not commonly those which the eye actually sees in the landscape or in the face, but those which the artist thinks "ought" to be there—a very different thing.

The price of metallic platinum, which already exceeds that of gold, promises to go still higher; and I advise all lovers of that most exquisite of printing processes—the platinotype—to purchase at once a good quantity of chloroplatinite of potassium, with which they can sensitize their own paper.

To make up, to some extent, for the increase in the price of platinum, the "quotation" for silver has gone down materially—from six pence to nine pence per ounce—during the last month. Silver nitrate is now quoted at three shillings per ounce.

The volume for 1891 of the *British Journal Photographic Almanack,* just issued, is a bulky volume containing no fewer than 750 pages of advertisements. One pleasing feature is that it contains a contribution from an American lady—Miss C. W. Barnes—whose subject is "Hints About Lantern Slides;" and very ably she handles her subject.

Hand cameras continue to be all the rage, and new makes are advertised weekly. Several of our great firms now provide a regular "series" of these attractive little instruments. My own "Detective" (horrid name!) is already quite antiquated, although it was purchased only a year ago. When loaded with twelve quarter-plates it weighs 8 pounds, while the new instruments of

similar capacity weigh just half as much. But the weight is not an unmixed evil. It gives rigidity and power to resist any slight shake imparted by the shutter; and I seldom, if ever, get a blurred negative. Then, I can sit on my camera! I should not like to test (at my own expense) the "feather-weight" instruments I now see turned out; nor should I feel disposed to rely on them for a long tour.

I believe frilling is not so common a cause of trouble with dry plates in America as in England; and yet—the climate being hotter, and heat appearing to be the chief cause of frilling—one would expect it to be more common in the States than in England. I expect the reason is that your plate makers put more chrome-alum in the emulsion, knowing that the plates are certain to be severely tried. Two good cures for frilling have lately been published. The first is a solution of tannin of 15 grains to the ounce; the second a mixture of 1 ounce of a saturated solution of chloride of zinc diluted with 7 ounces of water. Whenever a puckering of the film is noticed the plate should be rinsed and placed in one of these solutions for ten minutes. The tannin I have employed in my own practice for years past, and found it to harden the gelatine film remarkably.

Messrs. Sampson Low & Co. have just published a new book, "Wild Life on a Tidal Water," by Dr. P. H. Emerson, which is illustrated by numerous photo-etchings, the work of Dr. Emerson's own hands. The scenes illustrated and described lie in that part of England—East Anglia (Norfolk and Suffolk)—which the author knows so well; and the beauty of the illustrations is fully equalled by the powerful and descriptive letter-press with which they are accompanied. I shall hope to refer to this book again when I have had more time to study it.

The English professionals are bestirring themselves. At a preliminary meeting, held in Manchester, it was resolved to form a "National Association of Professional Photographers," the object being mainly to deal with the business difficulties which are continually cropping up. I may be wrong, but I doubt the stability of such an association, and think the work could be better done by a committee of a really national society composed of photographers generally, the first step toward which should be the amalgamation of the Photographic Society of Great Britain with the Camera Club.

One of our principal professional workers, Mr. Robert Slingsby, of Lincoln, has been studying very closely the subject of portraiture by the flashlight. He has written an able book on the subject (published by Marion & Co.), and he gave the other day, in London, an illustration of his method, which proved thoroughly successful. He uses four or six lamps upon a light stand fitted with branches and reflectors, and the same pneumatic impulse which fires the magnesium releases a shutter so arranged as to expose the plate at the moment of commencement of the flash. Still another good hint given by Slingsby is to burn a short length of magnesium wire behind a small translucent screen in the direction in which the sitter is looking, just before, and lasting while the exposure is made. This accustoms the sitter's eyes to the light, and prevents the "winking" and frightened appearance by which not a few flashlight portraits are marred. To professionals who cry for "more light" during the dreary winter months Mr. Slingsby's ideas are commended by

TALBOT ARCHER.

INSTANTANEOUS PHOTOGRAPHS OF ANIMALS IN MOTION.

BY W. E. PARTRIDGE.

THE question is asked over and over again, "Do instantaneous photographs correctly represent animals in motion?" Often it is varied, "Do they represent animals in motion as we see them?" It has been taken for granted that they do, and artists, the world over, are drawing running and galloping horses in the queer positions which they find in the photographs. The horse in the positions shown in the older pictures is no longer considered correct. Artists will not believe their eyes, and so photography has won an artistic victory.

Unfortunately there is another side to the question which does not appear to have been considered. The artist has accepted the camera as absolutely correct, but he does not appear to have considered the object of drawing a horse in motion, nor has any attention been paid to the second part of the first question. The eye, in considering an animal in rapid motion, sees the limbs only at the pauses or "dead points." Persistence of vision lengthens these out to, perhaps, the fifth part of a second. This further complicates matters by combining two successive nodes or "dead points" upon the retina of the eye at the same time.

The older artists, those who invented the conventional positions for the limbs of an animal in running, had a specific object in view. They wished to convey the idea of motion. It was not so much the animal as the feeling of flight through space which they wished to put into their pictures. On the other hand, the modern artist copying the instantaneous photograph, is more interested in the animal than in the act. The anatomy and pose must be accurate. He is not concerned with the fact that his horse may seem to the spectator to be having a bad attack of cramp. He is not troubled with fears in regard to the mental impression of motionlessness which he conveys.

The older artists seized upon the idea of motion as the most important idea, and then made the pose of the animal such as to convey this idea with the greatest power. It is true that two successive stages of action had to be combined in one. This, however, was correct, because the ordinary eye sees at the same time two actions which have taken place at different times. The leading idea is, represent the pose an instant after the maximum effort; with a culmination of power the muscles have hurled the body forward and have not reacted after the supreme effort. The body, unsupported, is bounding forward through the air. The effect of such a representation is to convey a vivid idea of motion. In representing a horse at a gallop, the idea of swift movement is conveyed by showing all the feet lifted from the ground at the same time. The eye accepts this as the natural result of the powerful thrust which the extended legs have just exerted and from which they have not yet had time to recover. And this is what our sluggish eyes actually see when a horse is actually moving faster than a trot.

No American artist has ever equalled Felix O. C. Darley in the power to convey the idea of action. There are very few foreign artists who have approached him in this respect. Scarcely a drawing of his can be found in which the figures do not seem to be actually moving. One waits for the hatchet of the Indian to fall, the sword to cut, the lash to fall upon the team. Yet his figures are not drawn in strict accordance with photographic truth. He was a

most prolific illustrator, and examples of his work are to be found without difficulty. Compare, for example, one of his running men with the famous instantaneous photograph of a record breaker crossing the wire at a speed of nearly twenty miles per hour. One can almost feel the whistle of the wind past Darley's flying figure. Every line tells of the swiftness of the forward motion. The very pose conveys the idea of speed beyond measure. Surely no mortal man ever ran so fast. But in the photograph a man with a pained expression of countenance seems to be jumping down a step or two. His hands are very tightly closed, his arms are very rigid, but it is hard to think of him as moving forward at any great speed. Indeed, he does not appear to be moving forward at all.

While the photograph is exact, it has taken no particular phase of the stride. Probably the limbs were moving so rapidly that the eye could not see them in such a position. What would be seen, would correspond to the beginning or end of a stride. The striking position would be at the beginning when the thrust had been completed.

The new school artists, seeking for absolute accuracy, are right in taking the instantaneous photograph as their guide, and drawing animals in various drawn and cramped positions. They are mechanically and anatomically correct, but they do not convey the ideas that the older artists presented. The latter accepted certain laws which depend upon the external nature of things and represented the idea of motion accordingly. That they were successful is a matter of history. The later men have other "fish to fry" and they are having success in another way.

If anyone wishes to further study this matter, let him take a set of instantaneous photographs of horses or other animals in motion—a few engravings by Darley and a Japanese drawing book with studies of horses in action. Darley's horses will run as though they were ready to spring from the paper. The photographic horses—well they impress different people differently, but they do not give the idea of forward motion. The horses of the Japanese artist will rear and race, jump and bite and fairly kick their shoes off, if they wore any, with their playful vigor. Shin anatomy is not very good, and they are not very handsome beasts, but they are the most "alive" horses that ever galloped across a printed page. In one of their old fan designs there is a pack-horse that has a limp; he is painfully lame in the "off" fore foot. Such a limp would have made Burgh's heart ache.

It may be an old-fashioned fancy, but we think that perhaps it is worth while to sacrifice a little abstract accuracy for the sake of truth.

THE GELATINE PLATE.

BY DR. LEO BACKELANDT.

[Informal Talk before the New York Camera Club.]

The idea of the lecturer, in his remarks, was to explain in an elementary way how a simple gelatine emulsion may readily be made by any amateur, and to give a general description of the various chemical reactions involved in its production. First, very few chemicals are necessary. Of these, nitrate of silver first claims attention. This may readily be obtained by placing metallic silver in nitric acid and warming gently. A clear solution of silver nitrate is thus

obtained. This, on evaporation, yields the solid salt, which is dissolved in water and crystallized out. This silver nitrate is a very important salt to photographers, for it is the salt from which all the silver compounds used in photography—silver iodide, chloride, bromide, etc.—are obtained.

Potassium bromide is another salt necessary to us. This is composed of potassium and bromine, very soluble in water.

Here the lecturer dissolved some silver nitrate in water in one tube, and some potassium bromide in another. Distilled water is used, and in both cases colorless solutions are obtained. Upon the addition of one to the other a heavy whitish-yellow precipitate is obtained, the silver combining with the bromine to produce insoluble silver bromide while potassium nitrate remains in solution. It is this silver bromide which is the sensitive medium in an emulsion. This silver bromide is very sensitive to light, and possesses another valuable property. As produced in the above way from strong solutions, the deposit is very coarse; but if very dilute solutions are used we get a thin milky solution, the particles of silver bromide remaining suspended for hours and even days. This desirable result may be still better obtained if we mix with the water some thickening material, such as sugar, gum arabic, starch, or, better than all, gelatine. We thus get a regular emulsion. The particles here are so small that they will remain in suspension for months. A gelatine emulsion is then simply silver bromide kept is suspension in a solution of gelatine. This gelatine seems to have more than a physical action, apparently acting chemically.

But if we examine the sensitiveness of this preparation of silver bromide in in gelatine, we find that it is far too slow for dry plate work. Some means must be resorted to for increasing its sensitiveness to light. Some years after the discovery of the gelatine process it was found that if, instead of using the emulsion directly after preparation, it was kept in the liquid state for a few days, a very decided increase in sensitiveness was obtained. This, however, exposed the emulsion to the danger of putrefaction, for bacilli thrive well in such gelatine. Later it was found that if instead of heating it to a low temperature for a long time, it was kept at 200 degrees Fahr. for about an hour, the same result was brought about. This is called the process of "ripening." Again, it was noticed that upon the addition of an alkaline substance to the emulsion, the ripening was even more rapid, and especially so if ammonia is used. This is the ripening process most suitable for amateurs.

For the mixing of an emulsion very little apparatus is necessary, and the majority of this will be already among the amateur's outfit. Although many qualities of gelatine are now specially manufactured for photographers, any quality will serve our purpose. Gelatine may be purchased either "hard" or "soft." Each form has its advantages, the one from its being little liable to frill and its firmness in setting, the other from its easier flowing power; better take half of each. Weigh out 25 grams of such gelatine, cut it into strips with a clean pair of scissors and place it in a beaker containing 140 grams of water. Stir it with a wooden rod, this being less liable to produce disaster from breakage. Let the gelatine soak in the cold water for some ten minutes, bring it into solution by immersing the beaker in warm water, and transfer it to a perfectly clean ink bottle.

Now take 14 grams of potassium bromide and place it in the bottle, placing this latter in a kettle of hot water. While this bromide is dissolving, make the

silver solution. Weigh out 17 grams of silver nitrate and dissolve it in 100 grams of water. To this add ammonia. A brown precipitate forms, and sufficient ammonia should be added to just dissolve it. The bottle and silver solution are now carried into the dark room and the silver solution poured into the bottle there. The contents of the bottle must not be at too high a temperature, or fogged plates will be the result of our work. The gelatine solution of silver bromide should be at about 100 degrees Fahr., and the silver solution cold. The mixing should occupy about five minutes, the bottle being well shaken after each addition of the silver solution. The ripening should go on for from ten to fifteen minutes. The emulsion, at this stage, is poured out into a clean soup plate and allowed to set. It is then cut with a silver knife, or, better, with a sharpened stick. The emulsion, at this stage, could not be used for coating plates, for it still contains potassium nitrate. This is removed by placing the gelatinous mass in a large muslin bag and immersing it in cold water. This is known as "washing" the emulsion, and takes from ten to fifteen hours. The washed emulsion is now ready for use. Place it into the bottle and add enough water to bring its weight up to 450 grams. Bring it into the liquid state by a hot water bath and filter it through flannel into a clean, warm earthenware teapot. This filtration removes any coarse particles of silver bromide and any foreign matter which may be present. Take a warm, clean glass plate, pour the emulsion into its center, and, by inclining the plate cover the whole of it. Pour off the surplus, and lay the plate down on a level table across which have been stretched copper wires. These prevent the spreading of any emulsion which may accidentally have got on the under side of the plate. When the film has set, stand the plate, face down, obliquely against a support and allow it to dry. This will take from eight to ten hours. An emulsion prepared as above will be found to give excellent results for landscape and transparency work.

[*From Photographisches Wochenblatt.*]

A WORD ABOUT LIGHTING THE DARK ROOM.

BY DR. A. MIETHE.

The complaints about foggy plates increase with the beginning of the warmer season, as we know by experience. There are several reasons. One of these is the frequent overheating of the dark room during spring time, or that in consequence of the warmer temperature outside, the solution, which cooled off pretty well during the night, becomes warmer again in the morning. We all know that warmer developing solutions work quicker and more energetic than cold ones, and hydroquinone and eikonogen particularly are very much influenced by temperature. Thus it may happen, that in place of clear negatives, foggy and flat pictures will be the result. On the other hand the light is considerably stronger in the spring than during the winter ; the red daylight passing through the windows, is chemically and optically much clearer. During the dark winter days we have become accustomed to work near to the window without observing the daily increasing strength of light.

Finally the light itself has acted energetically upon the colored medium, with which the windows are covered, paper and muslin have faded ; the spring sun completes the work, and the formerly reliable light filters fail suddenly. All these evils are prevented by working with artificial light; the ruby lamp or the

monochromatic dark room lantern shines alike every day, and after determining once the distance for working a certain kind of plates, this will hold good forever. An only exception are those red chimneys, which come into immediate contact with the flame. These chimneys appear to fade with time, as has been proved by observation.

After these considerations it seems to be apparent, without further reflection, that the irregular daylight be entirely discarded, and to work exclusively in lamp-light. But lamp-light has also disadvantages, which can easily be recognized. In the first place the evaporation of a lamp in the closed dark room—the latter oftentimes very restricted in space—is very inconvenient, and secondly, it produces heat, which is a very disagreeable addition in summer time; thirdly, it causes expense requiring attention and care, and it illuminates only a small space, surrounded by impenetrable darkness.

These are the main reasons which again and again cause the return to daylight.

What arrangements can now readily be made for a dark room illumination with daylight, and how can they be best accomplished?

Uniformity of course, cannot be demanded of the changeable daylight. But by suitable arrangements the light can be regulated within certain boundaries. Sufficient light with proportionate security against fog and such a kind of light can be obtained, that allows of the observation of the progress of the development in the transparent parts of the picture.

Three media are generally recommended to keep off the actinic light: colored (yellow or red) glass, paper and muslin. I must confess, that I am no friend of the red glasses. They have the advantage of being extremely durable; but they are too expensive, and secondly they can be had only with difficulty in good qualities. E. Vogel and others have proved that most of the red glass which is found in the market, admits the passage of a great many blue rays. Those who know how to handle a spectroscope, may be able to pick out suitable pieces of copper flashed red glass from the stock of a dealer; but this examination has to be conducted with the utmost care, as oftentimes different parts of the same glass vary considerably with regard to their absorption power. If such suitably selected ruby glass is combined with a dark yellow glass, a very useful and sufficiently strong light is obtained.

But to guard the development well, it is to be recommended to use on the inside a ground glass. This, shows, that a window of some size fixed up in that way, to light the room sufficiently, is pretty expensive. Much cheaper and giving more security are frames covered with paper or muslin, which, in the form of wings, can be adjusted to the window. I have experimented with many materials, and the results may be described here shortly, by illustrating the manner in which I fix up my dark room window.

Over suitable wooden frames which fit light-tight into the window opening, the following materials are stretched and fastened with chromated glue:

First.—A layer of thin hardware paper oiled and saturated on both sides with linseed oil varnish; a kind is selected, which is oftentimes used for wrapping up dry plates, looking, when not oiled, light red by transmitted light. This paper is very transparent when oiled. Its purpose is to catch the principal part of the actinic light to protect the easily fading material stretched behind it.

Second.—A layer of oiled, red chagrin paper. Such a chagrin paper—gen-

erally used for bookbinding—can be obtained easily in good quality. It must not be vermillion red by transmitted light, but should have a fuscine (aniline) red color. This paper also becomes very transparent after oiling.

Third.—A layer of yellow (canary) fabric.

A window fitted up with these three layers admits a very brilliant and safe light. Four square feet of window surface are sufficient to illuminate a pretty good-sized dark room. To give an idea of the safety of this light I mention that a sensitive plate at 1.5 m. distance from the window, placed vertically opposite the same, showed only after ten minutes the first trace of a fog, while the same kind of plate at 1 m. distance from the ruby glass chimney of an oil lamp showed foggy appearance even after four minutes. All layers are pasted with chromated glue. This is done to prevent the glue from rotting by moisture. Two to four per cent. of bichromate of potassium are added to hot common carpenters' glue of the usual thickness.

If the sun shines directly upon the window it is well to provide the latter with a yard of cherry muslin, or just as well, of highly red woolen fabric. Those who work with color-plates have to provide yet other special precautions to protect them from the red light. The development—until the appearance of the image—can take place in a dark corner and in a covered tray. I have worked in this way without ever observing that the light caused the plates to fog. To be quite safe, a shade made of brownish tissue paper may be provided, which can be let up or down. For color-plates (erythrosin silver) a monochromatic lamp is best.

THE PHOTOGRAPHIC PROCESS.

BY CAPTAIN ARTHUR FREIHERR VON HÜBL.

[From a Report to the Imperial Austrian Military Geographic Institute.]

As light sensitive substances the Halogen compounds* of silver are almost solely applied in negative photography, the opinion prevailing that traces of silver sub-bromide (also sub-iodide or sub-chloride) originate under the influence of light by cleavage of halogen molecules. All substances which easily unite with a halogen promote the cleavage and increase therefore the light-sensitiveness of the silver salt. H. W. Vogel designates such matters as chemical sensitives.

The wet iodide of silver plate contains a surplus of nitrate of silver as sensitizer, the collodion emulsion plate is sensitized by silver salts, tannin, morphine, etc. What causes the high sensitiveness of the gelatine emulsion has to the present time not been explained. To the gelatine we cannot ascribe such a strong sensitizing action, because it absorbs bromine only slowly. A decomposition product containing silver, to which this property belongs, perhaps forms from the gelatine and the bromide of silver when digesting in the heat.

When the photographic plate is exposed for the purpose of producing a picture, the halogen silver has to suffer a chemical change. The active light rays have therefore to possess a certain intensity to be capable of accomplishing the chemical performance. For every photographic preparation there is therefore a certain minimum of light intensity which has to belong to the light rays, if the chemical decomposition, and therefore also the formation of the picture, is to take place. If the intensity sinks below this line the light rays become

* Compounds of fluorine, chlorine, bromine and iodine—Eds.

ineffective for the preparation. Iodide of silver, for instance, with the presence of nitrate of silver (wet plate) will be changed chemically by light rays, whose intensity is not sufficient for the change of pure iodide, or chloride of silver, which rays therefore prove to be totally without effect for these preparations.

Light rays of very little intensity will act and produce an image upon a bromide of silver gelatine plate, while their action ceases upon the wet iodide of silver plate. In all branches of natural science we meet analogous appearances. Cellulose (cotton) we can expose for hours to heat, if the same is only of low intensity (temperature), without a chemical change; but if we bring heat of the same intensity to nitro-cellulose (gun-cotton), a chemical change will take place instantaneously, which we perceive as combustion.

This fact is very important for the practical part of photography; it explains the circumstance that it is impossible to photograph badly-lighted subjects with preparations not sufficiently sensitive.

If, for instance, an oil-painting with dark shadows is to be reproduced, even on a wet plate, sensitive for all reflected colors (orthochromatic) it will always give only a hard picture unfit for use, with bad illumination. The time of exposure is almost without influence, the high lights, with the increase of the same, become a little denser, the development exaggerates perhaps the texture of the canvas and the unevenness of the varnish a little more, but details in the shadows are not to be gained. To obtain a harmonious, fully exposed negative we have therefore to select a more sensitive preparation (emulsion plate), or the object has to receive a more intense illumination, for instance, exposure in sunlight.

Dr. E. Albert has very appropriately compared the accomplishment of light with the physical labor of a man who, by way of an example, has to move a heavy load across a sloping ground. If his strength is not sufficient to accomplish the work all his long exertions are to no purpose—he will not be able to remove the load from its place.

In certain cases conditions are intentionally introduced, which make the so-called full exposure of the plate an impossibility; less sensitive preparations are chosen, less intense light, so that even at long exposure some parts of the original remain photographically ineffective. In reproductions of line-drawings the lines have to appear clear and the planum sufficiently covered; but as the drawn line reflects also light, it would lose its clearness in the negative, if by application of a very sensitive photographic preparation, one would expose as long as the production of a sufficiently covered planum requires. In this case it will be conformable to the purpose to employ a less sensitive plate and not to illuminate the original too intensely, so that the rays reflected from the lines will become ineffective. Then one may expose almost any length of time without detriment to the clearness of the negative and obtain a good covered planum. For such views a wet iodide of silver plate is chosen, whose sensitiveness has been still more reduced by a strongly acidified silver bath, by addition of chlorides to the collodion, etc.

Besides these considerations quite a number of important points determine the selection of the photographic process.

We distinguish two groups of the negative processes according to application of physical or chemical development. The physically developed plate gives the outlines faultlessly sharp, while the contours of a chemically developed negative appear always "soft." This difference, of course, is only perceptible on views

taken from line-drawings, but for this branch of reproduction-photography it is of vital importance. The unsharpness of the contours appears to increase with the light sensitiveness of the preparation, and besides depends upon the composition of the photographic film. Gelatine plates, which in consequence ot their light sensitiveness, fog easy during development, and also Albert's highly sensitive collodion emulsion with ammoniacal eosin-silver as sensitizer show this disagreeable appearance to a high degree, while unripened gelatine emulsion or collodion emulsion with acid eosin-silver show an essentially more favorable condition, but still do not reach the wet bath plate.

Peculiar and yet unexplained is the phenomena, that moist emulsion plates show the above mentioned unsharpness to a much higher degree than in a wet condition. With moist collodion emulsion the cause might be ascribed to the fumes of ether arising during exposure; but as this evil is still more perceptible with moist gelatine plates, a common cause might be the reason. In the moist gelatine emulsion this fault is frequently explained by the thickness of the film, by supposing that the surface of the same does not conform to the picture surface. The corners in the plateholder press into the soft film, and the surface of the sensitive coating is then no longer in the plane of these corners, and therefore does not agree with the picture plane defined through the ground glass. I cannot agree with this explanation, the construction of our plateholders being mostly such that the congealed gelatine cannot be displaced from the corners, and furthermore the thickness of the moist film only 0.3 to 0.4 m.m., a size, which, even with objections of short focus, is without perceptible influence upon the sharpness.

The facts mentioned force the reproduction-photographer to the employment of the physically developed wet bath plate in all cases where a precise outline is an indispensable condition of the negative, also for views of fine line drawings, the autotype process, etc.

The production and treatment of the gelatine plate is also so complex that the reproduction-photographer will avoid it if he can. Its advantages, the high sensitiveness and the dry condition, are of the greatest value for the portrait and landscape-photographer, but the reproduction-photographer can easily abstain from them.

Even the collodion emulsion process, which latterly has entered again the circle of the processes at present in use, is not capable of replacing the wet plate. Still this process should be investigated by the experimentalist; here he will find a rich field for his activity, and it is very possible that the dry collodion plate will play a prominent part in the future. Its production and treatment is just as simple and easy as that of the wet plate, and the negatives distinguish themselves to advantage against the gelatine negatives.

For the reproduction of more compact line-drawings, the process may become fully useful, but in this case one should disregard principally a high-light sensitiveness. For the reproduction of very fine lines, a process with chemical development seems not to be suitable.

Most of the employed photographic preparations suffer only a change in the blue portion of the rays of light reflected from the object, which is then made visible by the developing process; rays of other colors are almost without action upon the photographic plate. Photography furnishes, therefore, only a picture of the blue which is present; only those parts which reflect blue light appear in

Negative by C. S. Kingsland.

THE BRIDGE AND THE FORD.

the photographic negative. A purely blue drawing upon white ground can, therefore, not be reproduced—the light reflected from the white paper acting only through its blue portion. In the reproduction of colored drawings this fact is a very disturbing element, as just those parts of the picture which act upon our eyes, yellow for instance, are reproduced almost black, the dark acting blue, however, appearing just as bright as white.

(*To be continued.*)

[*From Photographisches Archiv.*]

THE VIGNETTING OF ENLARGEMENTS UPON EMULSION PAPER.

BY DR. LIESEGANG.

For the production of vignetted enlargements upon gelatine emulsion paper, a mask of plain black paper with a simple smooth cut-out is generally used, which, to attain a soft gradation, is kept moving during exposure between objective and enlargement in the direction of the optical axis of the lens.

With long exposures this manipulation becomes very tiresome, and many operators have therefore suspended the mask from the ceiling of their studio. It is fastened on the inside of a light frame, in the style of an ordinary rod pendulum, by which action the requisite voluntary movement is effected.

This arrangement is pretty extensively used already in several German galleries. Although not exactly new, it answers the purpose so well that a description may follow here for the benefit of those who are unacquainted with the manipulation.

The opening of the mask is generally oval and without teeth, or bent like the ordinary vignette for contact printing. But an oval opening is not suitable for every bust picture, and a deviation from this usual form can be recommended. It causes no great trouble, as the cut-out need not be larger than for a negative in the printing frame, provided that the mask is placed at a certain point between objective and enlargement, namely, just as far in front of the objective as the negative is behind the same. In such cases a cut-out can therefore be easily produced, by leaving the exact outlines of the figure on the negative and cutting accordingly.

A light wooden frame, which can easily be made, serves as carrier for the mask. A piece of muslin is stretched over this frame, and on this paper is pasted. When dry an opening is cut out sufficiently large to admit various changes in the arrangement of the smaller openings, which are to serve as the proper masks. The proper mask may consist of thin card-board or black paper, and should be fastened to the frame with pins. At the corners of the frames two pieces of twine are fastened for suspension from the ceiling.

In place of the twine thin but straight iron rods may be applied, which will make the arrangement more solid and prevent every side-movement or deviation from the required exact oscillation of the frame.

It is of importance that the height of the oscillation point can be regulated, thus furnishing the possibility to make the gradation upon the enlargement more or less large, according to circumstances. The larger the distance between the center of oscillation and the optical axis of the objective, the longer the oscillation must evidently be and its course upon the paper accordingly, so that

according to the desired effect, in connection with the form of the cut-out and its distance from the enlargement, the most suitable amplitude (width of oscillation) can be found by regulating the height of the oscillation point. Each change of the latter requires, of course, a corresponding change in the position of the mask cut-out, and for this reason the above-mentioned constant large opening in the frame is necessary.

To produce a uniform oscillation of long duration it is recommended to fasten a weight to the lower part of the frame, suspended by wire or thread, and reaching almost to the floor. It is best to fasten the wire or thread to the corners of the frame so that they are suspended in the form of a **V** with a weight at the connecting point of both lines.

[*From the British Journal of Photography.*]

SILVER PRINTING.

BY EDWARD DUNMORE.

A Few Experiments and Deductions Therefrom.

Once more the question of permanency of silver prints has cropped up, and, so long as the process remains popular, may be expected to be of periodical recurrence. Much has been already said, and so much is known of the attributed vagaries of the process, that there is very little new to learn or suggest respecting it. Recruits to the army of photographers are continually being added, so that the repetition of an oft-told tale has at least the advantage of newness to some one or other. It strikes one forcibly that if only a tithe of all that has been known and written was remembered, it would leave little or nothing more to say. Permanency, to begin with, as connected with photographs, is a debatable term, and I do not think that any one giving thought to the matter will deny that the metals employed vary considerably in their powers of resisting atmospheric influence, and prints made by their aid seem to have a proportional resistance. We know that silver prints, made when albumen was first introduced for the purpose, are now in existence and good condition, and also that very many have become faded and obliterated; in fact, there is no disputing that the greater proportion of them have become faded and yellow—two distinct faults, by-the-by, which might have been confidently predicted of a process worked as largely and in the incomplete and unintelligent manner that silver printing on the whole has been. If we know why faults exist, we ought to be able to apply a remedy, and this by carefully examining the methods used in their preparation; but then, influenced by the general consensus of opinion almost entirely based on seeing so many defective prints, faults—owing to all manner of slovenly and makeshift plans, as certain in themselves to lead to disaster as if the prints were deliberately put in the fire and burned—have been without further thought ascribed to the instability of the process.

Many years ago a number of skilled chemists took the matter in hand, and the result of their investigations was certainly adverse to the permanency of silver printing; the conclusions arrived at were not encouraging with respect to the permanency of the process. No satisfactory explanation has been given why some silver prints remain perfectly good for an indefinite time, and others, prepared apparently in a precisely identical manner, fade rapidly away. The unknown quantities to be dealt with are seemingly fatal to any definite conclu-

sions being drawn. The paper itself may be good, bad or indifferent, and may be responsible for the eccentricities of prints made on it, but over which we have no control; in itself sufficient to upset any theory or to vitiate any experiment. Albumen also, or whatever does duty for it, varies considerably in quality. At certain periods of the year much of the egg albumen is obtained from preserved eggs, and behaves differently than from fresh eggs, and is less suitable for albumenizing. Albumen is also obtained from other sources—another matter rather beyond the control of ordinary photographers, who do not, as formerly, prepare their own paper.

Then, again, the different methods of preparation in order to gain a glossy surface, and make the paper keep well after sensitizing, add to the difficulties of the case and prevent any definite and reliable conclusions being drawn from the experiments photographers are enabled to make, for it is not very probable they will revert to the old plan of albumenizing their own paper.

Independently of all this there is no reasonable doubt but that a strong negative printed on heavily salted paper, sensitized in a strong silver bath, will give a more permanent result than the system adopted nowadays, when most other qualities have to give place to modeling and delicacy. The results are undoubtedly more beautiful, but less permanent. Without retouching (and the complaint of fading prints is almost entirely from portraitists), the majority of modern portrait negatives are thin images made up to printing strength by retouching, and it is to the lead pencil rather than to the real negative the photographer looks for effect, such negatives printed in the sun or very strong light giving but poor prints; the whole process is as much as possible contrived to give the best results from such negatives. Many photographers make a practice of reducing their over-printed proofs after they have been finished, so far as their final washing is concerned, by re-immersion in strong hyposulphite solution or weak cyanide of potassium until the image is sufficiently dissolved out. Prints reduced by either plan are probably less permanent than others not so treated; at any rate the color is somewhat impaired. Possibly the reducing action on the albumenate of silver, of which the modern prints are so largely composed, starts a decomposition that gradually continues till the proofs are worthless. Of course this applies to the best fixing, but is more pronounced with a second treatment, for it must be borne in mind that silver prints of the present day contain much less reduced silver and more organic matter than formerly, and are, as a matter of course, more easily affected by the hyposulphite and other reducing solutions.

The whole system of silver printing, as applied to portraiture in the present day, seems calculated to produce nothing but fugitive prints; they are certainly things of beauty, but not joys forever. The origin of the want of permanency is primarily in the thin negative; then follows printing on weakly salted papers, with a thick layer of albumen, and toning with a small quantity of gold. The fixing I believe to be frequently imperfect, and the washing afterwards very much too long. It is an undisputed fact that if prints are properly fixed, and the hyposulphite rapidly extracted afterwards, with a short washing to complete, prints will be very much brighter and better in color and gloss than if the hypo is slowly eliminated and the washing continued for many hours. This reduction of gloss by long washing seems to indicate that the albumen surface is partially dissolved by the long-continued action of water, and at the same time

incipient decomposition presumably sets in, the very means intended to enhance the permanency having precisely an opposite effect. If the negative is strong and good, the printing conducted in strong diffused light, a reasonable quantity of gold used in toning, the hyposulphite bath good and sufficiently strong, the fixing thorough and the washing effectual but brief, all precautions will have been taken that are required in the ordinary course of silver printing, and the results should be satisfactory in the matters of permanency and brilliancy.

The hyposulphite solution, which is a very important factor in the matter of permanency, may be inadvertently used too weak. The hypo may be bad in quality, so that when the proper quantity is weighed out the solvent powers will be much below the standard, or a large number of prints having to be fixed, the strength of the solution being sufficient for the first lots is not so for the last; the consequence is a proportion of the prints partially fixed yellow and fade after a comparatively short time, the first remaining good.

The next cause why silver prints fade is owing to the mountants or the mounts. The mountants in general use are starch, glue, flour-paste and gum arabic; of these starch is the most popular, and when pure perhaps as good as any. Starch and glue may, and frequently do, contain impurities that will destroy the silver print; the pure articles themselves, when made up for mounting, may become deleterious by keeping, which indicates they should always be freshly made. The white powder starch used for medical purposes is the best kind for photographers. Good flour-paste is not to be despised; it adheres well, is innocuous and cleanly.

The mounts themselves are frequently complained of. I am very doubtful if much harm accrues from this source. Some few years ago I mounted prints with starch and with gum on some of the common yellow-brown straw-packing boards and put them aside. Up to the present time there is not the slightest trace of injury apparent. This sort of board has the credit of being particularly impure. I have sometimes noticed that when impure mountants are used with a brush the brush marks are distinctly shown by faded or yellow lines on the face of the print, presumably where a rather thicker layer of the mountant remained. If fading was inherent in the print it would show itself in patches, or it might do so if the mountant was spread evenly by a roller or other means. Providing the mount itself was in fault, patchy discoloration and fading would also take place. Spreading spots with nuclei indicate foreign matter, not necessarily connected with the preparation of the print, in all probability particles of a sulphur character. Metallic spots on the paper are visible and at their worst as soon as the print is finished; they never spread afterwards. Mounted prints usually begin to fade and go yellow at the edges, the fault gradually spreading inwards. This is generally attributed to the action of the atmosphere on the less protected parts—the edges. If this theory is right unmounted prints, to which the air has free access all over, should be the first to fade, but, as we know, the contrary is the case. The conclusion one naturally comes to is that the cause of fading is either in the mount or mountant, and not in the print itself. Why modern prints more rapidly deteriorate than those prepared years ago seems to be because they have not the stamina in them to resist pernicious influences, even if carefully prepared in all stages, and as many are not so prepared from a chemical point of view thousands come to grief, and poor silver printing gets more and more the character of an unreliable process without deserving it.

CONFERENCE OF THE AMATEUR PHOTOGRAPHIC ASSOCIATIONS OF THE UNITED STATES,

held at the rooms of the Society of Amateur Photographers of New York, 111, 113, 115 West 38th Street, on Thursday, December 4, 1890.

In response to a call issued by the Syracuse Camera Club, twenty-six delegates representing the following photographic societies answered the roll-call: Boston Camera Club, Old Colony Camera Club, Hartford Camera Club, Newark Camera Club, The Society of Amateur Photographers of New York, Photographic Section of the American Institute, Brooklyn Academy of Photography, Hoboken Camera Club, Peekskill Camera Club, Photographic Association of Brooklyn, Washington Camera Club, Albany Camera Club, Cincinnati Camera Club, Photo-Section Cincinnati Society of Natural History, Postal Photographic Club, Syracuse Camera Club, Lynn Camera Club, Photographic Society of Philadelphia, Yonkers Camera Club.

The following clubs heartily endorsed the call and promised to give earnest support to any movement in behalf of forming a National Association of Amateur Photographers: Plainfield Camera Club, Photographic Society of Waterbury, Conn., the New Orleans Camera Club, Pacific Coast Amateur Photographic Association, Cranford Camera Club, Agassiz Association, Manhattan Chapter, N. Y., Amateur Photographic Society of Baltimore, Md., Chicago Lantern Slide Club, Adrian Scientific Society, Adrian, Mich., Providence Camera Club, Mystic Camera Club, Columbus Camera Club.

Mr. James H. Stebbins, Jr., President of the Society of Amateur Photographers of New York, called the convention to order, and, in a few well-chosen remarks, welcomed the delegates to New York, and extended to them the privileges and freedom of the quarters of the New York Society as long as they should remain in the city.

Mr. Yates, President of the Syracuse Camera Club, on being nominated for temporary chairman, declined and nominated Mr. F. C. Beach, of New York. There being no other nominations, Mr. Beach was declared elected. Mr. Wallace Dickson, of the Syracuse Club, was made temporary secretary. On the roll-call twenty-six delegates responded, representing nineteen societies.

The call issued by the Syracuse Camera Club, dated August 5, 1890, was then read, as was also the supplemental address, dated October 25th.

Dr. Ely Van de Warker, of the Syracuse Camera Club, being called upon to outline the objects of the proposed national association, did so in a neat little speech. Among other things, he said that "those of us who had studied the history of photography were well aware of the important role that had been played by the amateur in its development." He drew the conclusion "that what we have to-day of this beautiful art is indebted in no sense scarcely to the tradesman, but in every sense to the scientific, enthusiastic, and intelligent amateur."

This being the case, it had occurred to him that it would be an important matter to have a national association of those interested in photographic work, aside from its commercial relations. He recalled the fact that such a scheme was on foot in France, and on the spur of the moment the first call, hasty and imperfect as it was, was issued at his suggestion by the Syracuse Club. He learned, however, that the idea with him was not original by any means, and

that many other gentlemen had thought of the same thing, and, in fact, some were on the eve of launching such a scheme. He could not see that anything but good would result from a national organization of the amateurs of America, to whom photography is indebted, and he believed that if this enterprise is successful, and brings within its fold all the best spirit that is engaged in the work of a non-commercial character, it will have an important influence (spreading in every direction in all collateral branches that are associated under the broad term photography) for the better.

In closing, Dr. Van de Warker moved the following resolution: "*Resolved*, That it is the sense of this meeting that it is desirable to form a National Association of Photographic Amateurs." His resolution was unanimously adopted. A committee consisting of Messrs. Van de Warker, Bullock, Burton, Spaulding and Thomas were appointed to report a Constitution and By-Laws; also nominate the officers. A recess for half an hour was then taken, at the end of which time the committee returned. Dr. Van de Warker, as chairman, reported the proposed Constitution and By-Laws, which, with a few changes, were adopted. The essential features of the Constitution and By-Laws are that the membership consists of delegates, subscribing members and honorary members. Delegate members are elected annually, to serve one year, from each society entitled to representation, in the proportion of one delegate for each five members. Subscribing members are those elected by the council on evidence of eligibility, except when a subscribing member has been a delegate, when he becomes a subscribing member on payment of dues. Dues are three dollars yearly. Ladies are eligible as members. The Conference holds an annual meeting and exhibition in the spring, the place to be determined at the previous Conference.

The Conference is governed by a council of fifteen members, consisting of the officers and ten members. The council may invite manufacturers and dealers to exhibit photographic apparatus, appliances, etc., at each annual meeting, provided such exhibition is detached and wholly distinct from the official exhibition of the organization.

The committee were again requested to retire in order to report the names of proposed officers and council, and were also given power to name the time and place of the next annual meeting of the Conference.

The committee returned in a few moments and reported the following names as officers and members of the council:

Officers: President, Dr. Ely Van de Warker, Syracuse Camera Club; 1st Vice-President, George Bullock, Cincinnati Camera Club; 2d Vice-President, Dr. George L. Parmele, Hartford Camera Club; Secretary, T. J. Burton, The Society of Amateur Photographers of New York; Treasurer, W. H. Drew, Boston Camera Club.

Council: R. Dickinson Jewett, Washington Camera Club; F. C. Beach, The Society of Amateur Photographers of New York; Professor Randall Spaulding, Postal Photographic Club; Edward Weston, Newark Camera Club; Harry S. Fowler, Brooklyn Academy of Photography; John V. L. Pruyn, Albany Camera Club; Robert S. Redfield, Philadelphia Camera Club; Cornelius Van Brunt, Photographic Section of American Institute; A. J. Thomas, Hoboken Camera Club; J. W. Alexander, Yonkers Camera Club.

They also reported the third Tuesday in April as best time to call Conference, and New York as the place.

The report was unanimously accepted by the Conference. The Chairman extended an invitation from the Hoboken Camera Club to attend a lantern slide exhibition.

Notice was also given that the Board of Directors of the Society of Amateur Photographers of New York would tender the delegates a reception at their rooms in the evening.

Dr. Van de Warker took the chair as the President, and thanked the members for the honor conferred upon him.

All the delegates who were present were requested to hand their names in to the Secretary for enrollment.

Notice was given that the council would meet at 4 P. M.

After passing a hearty vote of thanks to the Society of Amateur Photographers of New York for the hospitality and courtesy displayed by them towards the delegates, the Conference adjourned to meet at New York on April 21, 1891.

T. J. BURTON,
Secretary.

[*From the Photographic News.*]

DRAWINGS FOR PROCESS BLOCKS.

DURING the past few years newspapers and periodicals of all kinds have blossomed into illustrated publications, and we know that this is due to the ease with which a printing-block can be produced, without the intervention of an engraver, by the photo-zincographic or one of the allied processes. There has, therefore, sprung up a demand for draughtsmen who are capable of executing the kind of drawings which are alone suitable for this quick method of reproduction as a printing-block ready for the press, and schools are being started where the necessary education for such work can be obtained.

Among photographers generally, there are many who are adepts with their pencils —practical artists who have been tempted to join the photographic army because of the attractive features of such work, and also because they knew that they could bring to bear their art knowledge upon it, and so hope to achieve something in the way of portraiture rather above the average. From such men have our best photographers sprung, while there are not a few who, although they have not been able to reach the topmost rung of the ladder, are sufficiently clever with their pencils to work up enlargements, and to do much in other ways to help them in their daily practice. To photographers having such artistic tastes, a knowledge of the best means of executing a drawing from which a printing-block can be made should be most valuable, and we propose to give in the present article a few hints upon this important subject, and, for the sake of simplicity, we will only deal with the method of producing a line drawing in ink for the zincographic process.

It is a necessity of this process that the drawing shall consist of lines or dots, or the two combined, and that the various half-tones, or *tints*, as an engraver would call them, shall be made up of such dots or lines placed nearer or closer together, according to the depth of tint required. The zinco process is essentially a black-and-white method, which admits of no half-tones, as a photographer would understand that term, these half-tones being made up of the juxtaposition of lines as just described. We would advise anyone who has never done any of this sort of work to study a collection of drawings of the kind as a preliminary operation. He will have no difficulty in obtaining such a collection, for it has for some time been the very commendable custom to issue illustrated catalogues of our chief picture exhibitions, both oil and water-color. In these catalogues, rough, and in some cases highly finished, sketches of the principal pictures are reproduced by the process under consideration, and as

these sketches are furnished by the artists who have painted the original works, they are, as a rule, executed in a masterly manner, and, as far as is possible in such a medium, the peculiarities of touch are faithfully reproduced. The same remarks apply to Mr. Blackburn's admirable "Academy Notes," and we should also recommend the student to get the French publication, containing nearly three hundred pictures, entitled "Catalogue Illustre du Salon," which can be obtained through any foreign bookseller. After careful examination and dissection of such pictures with a good magnifying glass, the student will learn how the different effects are produced by different hands, and will be tempted to try himself what he can do in the same direction.

The materials are of the simplest. Bristol board of good quality is the basis to work upon, while the best ink to employ is "Stephens' Ebony Stain." Ordinary indian ink rubbed up in a saucer will, after a short time, thicken, clog the pen, and refuse to flow with ease, but the medium which we recommend has none of these faults, while at the same time it gives an intensely black line. Some artists prefer to work upon a chalk-faced card, which is manufactured for the purpose, for the reason that the lines inscribed upon its smooth surface are more perfect in outline than is possible on Bristol board. We should, however, advise the tyro to begin, at any rate, on the latter material, and to try the other when he has had a little practice.

It is the invariable rule to draw the original picture a good deal larger than it is intended to be when finished in the form of a printing-block, for, by this artifice, the general work is rendered finer. It would be next to impossible, indeed, for the finest pen to trace lines so delicate as those represented in several of these process pictures. But the amount of reduction which is allowable is a question that requires very careful consideration. We once saw a very beautiful pen-and-ink drawing measuring about twenty-four inches in length, which was executed by one of our first artists. It was required to reproduce this in block form, but, in the process, the original was reduced to about half-plate size, with the result that the details seemed to be all reduced to a uniform, flat, ineffective gray. The best rule to follow is to ascertain first the size which the future block is desired to be, and then to make the drawing not more than about twice its length and breadth—that is to say, four times the area that the picture is subsequently to be.

In such work there is always a temptation to over-elaborate by filling in every atom of space with an assemblage of fine lines. This is a mistake, for the beauty of a drawing does not depend upon the amount of work which it contains, but rather upon the disposition of its lines.

[*From the British Journal of Photography.*]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

CHAPTER VII.—THE STUDY OF THE FACE.

(*Continued.*)

BEFORE we leave the study and treatment of the eye, a few more remarks upon this important feature may not only prove opportune, but they may add considerably to the store of knowledge necessary to insure the success of the beginner who seriously wishes to master the many little delicacies of the art of retouching. One should never desire to pass too hurriedly over a subject which is of such vital importance, and which, if but imperfectly mastered, will lead the student into many grave errors, which will, in turn, more or less mar the chances of his ultimate success.

Beginners are very often disposed to either accentuate too strongly the indications of the eyelashes, thinking thereby to flatter the vanity of a weak-minded sitter, or else to obliterate them completely, producing as nearly as possible the effect as though they had been singed, and of course by so doing thus ruin the expression of the eye.

Such an unthinking treatment (for no one who reflects for a moment upon the subject would do so) is of course fatal; no portrait subjected to such manipulation could ever prove satisfactory or successful. As for the upper edge of the lash, it should be very carefully softened into the lid, and the lower edge should graduate imperceptibly into the shadows which it throws upon the orb beneath it. In this treatment, the drawing, as it were, of the lid must be seen through the outer portion of the lash, and must be quite distinct from it, although of course in a subdued and tender tone.

The form or shape of the pupil of the eye is altogether governed by the relative position of the head; in full-face portraits it is round, in profile it is oval, and can have all the intermediate degrees of form, as the face may be turned in half profile, three-quarter face, etc. These various changes in the position of the head will of course control the lighting of the eye, and great care should be exercised in this regard, or we will surely spoil the effect we are so anxious to secure.

As before stated, where not absolutely necessary, the retoucher should leave this feature as little worked upon as possible; but certainly he should know thoroughly how to treat it satisfactorily if obliged to take it in hand. We will therefore see what is best to be done in the case of our being obliged, from one reason or another, to at all touch the eye. We should start by placing a light upon the top light side of the iris, but not in such a manner as would attract too much attention or become too prominent. This light will be but a speck as it were, and somewhat of the shape of a wedge; and opposite this, in a direct line with the source of light, must be a longer light much lower in tone, and about the third of a circle in form, and taking the same curved direction as the iris; this will represent the luminous effect produced by the light striking on and passing through the convex form of the eye. A light, too, may be placed on the light side of the white fibrous membrane, but having a care not to block up the necessary shadow formed by the upper eyelid. A small light, proportionately subdued in tone, may be placed in the extreme corner on the shadow side where the lids intersect; a few judicious touches on the edges of the lids where the lashes begin may be placed with advantage in many cases, but he must not in the least interfere with the dark spaces between and formed by the lashes. In this manner, if successfully carried out, the life and expression of the negative may be greatly enhanced.

A word of warning may be offered to the student here, to exhort him to avoid falling into an error often made, not only by beginners, but very often persisted in by many retouchers of long experience—that is, of destroying the extremely delicate transparency of the skin immediately under the eye; every particle of half tone should be most carefully preserved, as it is really invaluable in imparting expression and softness to the eye. For men of experience in the art of retouching to be guilty of spoiling this portion of the face it may seem difficult to find an excuse, but really I feel sure in most cases it is the result of thoughtlessness more than any want of knowledge. This fact will furnish another proof of the necessity which I have tried to emphasize in the early part of this work, for the student to be ever thoughtful, and always give full consideration as to the proper treatment of each and every head he may have to retouch. It is a certainty, if he consider for a moment, he will never obliterate those delicate effects of half tone, which not only mark the difference between a skillfully and unskillfully lighted portrait, but which are also so potent in giving a life-like expression to the feature under notice.

The lower lid, in the majority of cases, will be found to have two or three sharp and distinct lines under or upon it, and sometimes also a furrow under it. This latter will of course be greatly influenced by the lighting of the picture. If a strong top light prevail, it will become exaggerated to a most unnatural extent, and must consequently be considerably modified by the retouching, so as to assume a more natural and pleasant appearance. Care must be taken, however, not to reduce it too much, for by so doing, much of, if not all, the likeness may be completely destroyed. In

many faces it is a positive mark of individuality, and must be preserved as such. Even when the light has been carefully arranged, and so diffused as not to unduly accentuate this furrow, there are other causes which may make it so strongly marked as to demand the retoucher's skill to rectify its defects. Sorrow, age, pain or excessive pleasure, will all cause this furrow to appear strongly marked, and in such cases judicious modification will greatly improve the picture.

(*To be continued.*)

WHY DOES THE BACK OF PRINTS TURN YELLOW WHILE IN THE FRAMES PRINTING?

BY P. ERSLY.

It is not uncommon to hear complaints from the print room during wet weather that things work differently from what they do in dry weather, which will be readily admitted. Now this simple fact seems to me to suggest the cause and also the remedy. The damp atmosphere enters the room and everything is affected by it. The paper becomes damper than usual (if kept where the damp air can come in contact with it). It is more likely to get the bath out of order, takes longer to dry, and is liable to be put in the fuming box before it is dry; is liable to tone differently, and more liable to spots, stains, streaks and blisters; and, finally, it is liable to be less permanent when finished. Next come the frames and pads, saturated with moisture, which will surely cause the back of the print to turn yellow.

Spoiled prints put between the paper and pad do not help the matter. It may help the first print, but by the time that is made the dampness from the pad has acted, so there is no improvement. The remedy comes in drying the pads and frames. Just try it once. Put a print out with a pad that has been in a damp atmosphere; then dry your pad and put out another, and note the difference. To-day I have been printing under the skylight while the rain is falling. It has been raining for several days, so that the print room was very damp. I put my whole outfit into a room where I had fire enough to dry the atmosphere, and my prints were never better. And, further, I can keep my paper and use it for several days, and see no difference in the results. It seems to me if there were as much attention given to printing as there is to negative making, these little annoyances would become obsolete. It is only by constantly watching and closely observing all the changes and studying the cause that one can hope to succeed in the printing department

OUR TWO ILLUSTRATIONS.

With this issue of the Bulletin we present our subscribers with two illustrations instead of one, which has hitherto been our practice. We intend to give these extra illustrations from time to time in order to present examples of meritorious work in single photographs; and where we cannot secure a series of negatives to furnish the illustrations that our ever-increasing number of issues demand, we shall still give each month an albumen print of high-class work, and also the regular photogravure or gelatine print in the second issue of the month; while the extra illustrations will be furnished by such reproductive processes as best suit the character of the pictures offered.

In the present number the albumen print is from the studio of Dana, the well-known artist of Broadway, New York. It represents a development of photography in a truly artistic direction, and is stamped with individuality of production and skillful photographic work. This variety of picture has become quite popular in New York, and Dana has many imitators, which is the greatest flattery in any kind of artistic work. We hope that each of our subscribers will find the "Ivoryettes" well worthy of study and a source of pleasure to the eye.

The photo-mechanical print is a reproduction of an excellent little bit of scenery by Mr. C. S. Kingsland, of New York. As a piece of composition it is well worthy of study, and is full of that rural effect that delights the heart of every true lover of nature. As a photograph the original is particularly fine, and almost all of its beauty is well preserved in the reproduction which was made by Mr. W. Kurtz, of New York. The airy and delicate foliage, the limpid stream, the sparkling lights upon the water, the fine contrasts of light and shade, all go to make up a most charming picture.

OBITUARY.

W. R. HOWELLS.

Mr. W. R. Howells was at one time one of the prominent photographers of New York City. He occupied a studio on Broadway at 18th street, and his patronage was of the best classes of society, actors and actresses, and prominent men and women. He died on December 13th, at the residence of Mr. L. C. Perkinson, West 125th street, New York City.

In the Vienna Exhibition of 1873 he obtained a special grand prize for his photographic work, and was an expert in the wet-plate process. He was a natural artist and a genial gentleman. His loss is mourned by many friends.

THE DICTIONARY OF PHOTOGRAPHY.

To the Editors of the Bulletin :

I have not for one moment intended to claim priority with regard to the table of angle of view, as might be inferred from the Rev. Dr. Woodman's letter in your issue of last week ; the said rule and table were taken from my note-book, and had I known the author, I should have been only too pleased, as you suggest, to have acknowledged the same, but the table was copied by me first in 1886 from some source which I cannot now trace. Dr. Woodman is well known to me from his clear notes on optical matters, and I gladly give to him the honor, and will note for correction if another edition be called for.

London, November, 1890. E. J. Wall.

THE BULLETIN FOR 1891.

The Bulletin has gradually but steadily worked its way upwards in the ranks of American photographic literature until now it is second to none in the quality and quantity of material that it presents to its readers. The testimony of its ever-increasing subscription list is the best evidence that its course is appreciated by photographers. Its aim has always been for the advancement of pho-

tography in all its phases. It has advanced and nursed the best interests of the profession, as well as offering every encouragement to the amateur.

Looking back over the past year, the BULLETIN has been foremost in placing before American photographers the latest developments of the art. The eikonogen developer was noticed in its pages, and its character described long before other journals even thought of its great value. Acid-sulphite was announced and its uses made practical to photographers in the United States for the first time in this journal. The results of the Congress of Photographers in Paris were also noticed in this journal immediately on receipt of the reports on this side. The method for the reversal of the image by thio-carbamides was first seen by American readers in these pages. Primuline, the new printing material, also received the earliest extended notice in the pages of the BULLETIN. Our facilities for obtaining news from Europe and bringing it before our readers are not equaled by any other American photographic journal.

The contributors of original articles to the pages of the BULLETIN are in the first rank of both American and foreign photographic workers. There is not a name among them but tells of either high scientific or advanced practical ability.

In the matter of translations no other American journal attempts to reproduce from German and other sources the advanced class of articles on photographic subjects that have appeared in these pages. Many of these are reproduced in English photographic journals, and not always with an acknowledgment of the source whence they obtained them.

As usual our reports of societies are as full and as accurate as possible—in a great many cases fuller and more accurate than those of our contemporaries who ask more from their subscribers.

Our correspondence department is always an important feature of the journal, and its popularity remains as great as ever. We have never printed a question that has not come from a *bona fide* inquirer; although there are journals where such queries are concocted in the office of the editor.

We are led to speak loudly in praise of what has been accomplished by the BULLETIN, because we are satisfied that the Editors and their staff have done everything in their power to make the journal the best in the United States. Every effort of theirs has been willingly seconded by us, and every dollar received as subscriptions has been expended in the interests of the journal. This being the case, it follows that the greater the number of our subscribers, the better we can make the journal. As the BULLETIN is not issued to pay dividends, but to encourage the art of photography, and as our facilities for the collection of photographic information are unsurpassed, we claim we can give our readers more good material for their money than they can obtain in any other manner. Therefore every subscriber has a personal interest in the work, and the greater the number of subscribers the better the results must be. Send your subscription early and help the good work along. Subscribe to the journal that has the largest circulation in the United States, and is therefore doing the greatest good to the greatest number.

E. & H. T. ANTHONY & CO.,
Publishers.

I think the BULLETIN is as good a reference book and art journal as a person can get.

J. R. MOELLER,
Nebraska.

ANTHONY'S
Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,

Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,

and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

PLAINFIELD CAMERA CLUB.

THE annual meeting of the Plainfield Camera Club was held at their rooms in the Clarkson Building, December 16th, *President* TEALE being in the chair. The minutes of the last meeting were read and approved.

The reports of the Secretary and the Treasurer were read, showing the club to be in a prosperous condition as regarding membership and finances.

Messrs. Ross, Lowey and Buttfield were elected to membership.

The election of officers was proceeded with, and the following were elected for the ensuing year: O. S. TEALE, *President;* G. H. BABCOCK, *Vice-President;* G. E. GREENLEAF, *Secretary;* W. H. LYON, Jr., *Treasurer.*

The President and Secretary were appointed a committee to revise the Constitution and By-Laws and present their revision at a future meeting.

The President was authorized to appoint a committee to arrange for representation of the club at the Liverpool and Vienna exhibitions in April, 1891.

A paper on "The Making of Lantern Slides" was read by the President, and was followed by an informal discussion of the subject.

During the meeting attention was called to the fact that the club had now a fully equipped gallery with skylight, back-grounds, camera and all accessories, together with dark rooms, enlarging room and camera, and was therefore able to offer to members everything necessary for all branches of photographic work. GEO. E. GREENLEAF,

Secretary.

BROOKLYN ACADEMY OF PHOTOGRAPHY.

THE regular monthly business and technical meeting of the Brooklyn Academy of Photography was held at its pleasant rooms, 517 Fulton street, December 10, 1890. *President* FRANK LA MANNA occupied the chair, and after the reading of the minutes of the previous meeting by Recording Secretary Hermance Tremper the following were thereupon elected to membership in the academy: Dr. William Moore, Dr. H. B. de la Tour and Edward S. Watkins.

The report from the delegates to the Conference of Amateur Photographers, held in New York, December 4, 1890, was then made by Harry S. Fowler, who was honored by the conference in being placed upon one of its principal boards. Mr. Fowler read a report of the meeting at some length, in which he said that some twenty-five different societies from all over the country had been represented.

A letter was then read from Clarence W. Brown, Secretary of the Washington Centennial Celebration Committee, in which he expressed his appreciation of the pictures sent by the members of the academy. The prints referred to were taken of the principal features of that memorable event, and the academy is to be honored by their being placed in the memorial volume of the celebration. The business of the evening having been disposed of an informal discussion of the experiments made by E. T. Morey, of the French Institute, followed.

The rooms of the academy are extremely pleasant, and while, owing to the special feature of lantern exhibitions made by the society, only a few prints are upon exhibition, those that are displayed are well worthy of special notice. Among these is one which bears the signature of Janssen, the President of the scientific academy of Paris. It is a rare view of the sun spots, and was presented to Mr. La Manna by Janssen himself.

Another is a remarkably fine one of the moon's surface made by the Henry Bros., of the Paris Observatory ; and still another is one of the first views ever taken from a balloon. The camera was snapped when the air-ship was 2,000 feet above Paris, and it is a curious study to observe how many of the minor details of the landscape far below may be almost distinctly noted.

COLUMBUS CAMERA CLUB.

On the evening of December 17th was held the annual meeting of this society. The *Presiaent*, Mr. Howe, delivered his annual address, which proved to be an interesting review of the past year, and contained many valuable suggestions for the future work of the members.

The Secretary, Mr. Combs, who carefully records the work of the meetings, presented his report for the year, which gave evidence that the club had not been idle. The membership was steadily increasing, as were also the club's comforts. During the year the society had moved into its present pleasant surroundings, to which had been added a daylight enlarging apparatus, comfortable chairs, valuable books and good specimens of the members' work framed and hung on the walls.

Three well-attended public entertainments were given : "Glimpses of California," "In and About Columbus, O.," and "Chicago, the World's Fair City."

This society believes in presenting all sets of slides from other similar societies which come into their hands to the public, and are giving them for the benefit of the different charitable organizations of the city, and in this way add their mite to the welfare of the city's unfortunate. In this way the people of Columbus have come to learn more of the club, and to appreciate the work of amateur photographic societies.

Another report of interest to the members was that of the Treasurer, Mr. Hull. He gave conclusive evidence that the financial condition of the club was healthy, notwithstanding the closeness in money markets, by reporting a good bank account and no outstanding debts.

The final work of the evening was the election of officers for 1891, which resulted as follows :

President, F. H. Howe ; Vice-President, J. N. Bradford ; Secretary, F. J. Combs ; Treasurer, J. J. Jennings.

The members left full of enthusiasm for the year's work before them.

The Secretary being pressed for time, it was decided that the Vice-President assist by giving reports of meetings to the journals.

On the evening of December 30th this society also gave another public entertainment, by presenting the illustrated lecture, "The White Mountains," prepared by the members of the Boston Camera Club. It was given for the benefit of the city's charitable organizations.

Owing to the many demands upon the people, due to Christmas time, the audience was not as large as upon former similar occasions, but those who listened to the lecture and viewed the grand scenery of the White Mountains, were certainly rewarded by this presentation of picturesque views of the crown of New England. The lecture, which imparted the romantic interest attached to these famous mountains, was delivered by the President of the club, Mr. F. H. Howe, and the lantern was managed by Mr. G. L. Graham, a member of the club and an expert with the instrument.

J. N. Bradford, *Vice-President.*

Bibliography.

The American Annual of Photography for 1891. Edited by C. W. Canfield. New York : Scovill & Adams Company.

As usual this well-known annual is promptly before us. It is as handsomely presented as ever, nicely illustrated, and contains a large number of interesting articles on photographic and kindred topics by some of the best writers of the day. There are about 250 pages of original articles, together with a large number of tables, lists of societies, etc. The illustrations are of fine quality, two of the best being "I Love 'oo,'" by Mr. Franklin Harper, and a portrait study by W. Kurtz.

Carbon Printing.—Explicit Instructions for both Professional and Amateur Photographers. By Max Boelte, Ph.D. New York : E. & H. T. Anthony & Co.

This is an excellent treatise upon carbon printing by one who has had probably as extensive an experience as any who have handled the process. The devices used by the author in his practice are reproduced from his own sketches, and his methods of working are given with the precision of a teacher and one thoroughly conversant with his subject. We know of no treatise on any phase of photographic work that is better written or more practical than the neatly printed little treatise before us.

TRAITÉ ENCYCLOPÉDIQUÉ DE PHOTOGRAPHIE. Par Charles Fabre. Paris: Gauthier-Villars.

We have before us the eighteenth part of this handsome encyclopedia of photography. Like each preceding section of the volumes it is beautifully presented, and is full of most interesting matter. The part before us treats of photo-micrographic work, photo-spectrography and the decisions of the Congress of Photography of 1889, together with a large amount of bibliographic matter, and spectro-photography applied to astronomy. Two more parts will complete the four volumes of one of the best encyclopedias of our art yet written.

LA PHOTOGRAPHIE JUDICIARE. Par Alphonse Bertillon. Paris: Gauthier-Villars.

This is a neat little French volume written by the Chief of the Identification Service of the Paris police. The author gives the photographic methods pursued to obtain records for the identification of criminals, and the treatise will be found extremely interesting to police officials, detectives and all persons interested either directly or indirectly in criminals. The volume is handsomely illustrated with a number of plates.

TRAITE DE PHOTOGRAPHIE PAR LES PROCÉDÉS PELLICULAIRES. Par George Balagny. Paris: Gauthier-Villars.

This is an exhaustive French treatise on film photography. It is published in two volumes, giving the methods of production of a number of film supports of the photographic surface and the manner of manipulation. The author also describes the various apparatus used with the different kinds of films and the best methods of development. The application of films to various kinds of photographic work also forms an interesting feature of the volumes. In a word, these books give an excellent resumé of film photography from the earliest times to the present.

FORT SCOTT, KANSAS. Indelible Photographs. By J. V. Dabbs. Fort Scott, Kansas, 1890.

This is a handsome series of albertype prints of interesting localities in and around Fort Scott, and from negatives by Mr. J. V. Dabbs, the well-known photographer of that city. They are exceedingly well done, and accompanied with an historical sketch. As an appendix there is a pretty poem dedicated to Fort Scott by Albert Bigelow Paine, the music of which breathes of the heart-throbs of one of the city's most faithful sons.

GLIMPSES OF THE A. C. A. 1890. By S. R. Stoddard, of Glens Falls, N. Y.

These are a handsome series of gelatine prints of the meeting of the American Canoe Association, which was held at Jessup's Neck, Long Island, last Summer. As usual with Mr. Stoddard's work the pictures are characteristic of the occasion and well taken, some of the flash-light effects at night being especially good. Those who love to ramble around Long Island, and every lover of the canoe will enjoy this handsome album of pictures.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—B. Bros. enclose prints and write: Will you please examine the toned print and also the untoned ones, and tell us through the columns of the BULLETIN the cause of the trouble. There are two faults in these prints: first, the grain of the paper always shows, no matter how it is worked; secondly, the tear-drop effect is not caused by tears, for we use alcohol and well rub the surface of the paper with cotton. Some were floated one minute, others one and a half minutes, and some two minutes on a 60-grain bath, fresh and new, in a room 65 degrees temperature. The bath was neutral, not acid, and the paper was drawn over a glass rod. The fuming was for twenty-five minutes.

A.—See that the bath is not too alkaline, test it with red litmus. If it is, the albumen will be dissolved off and the paper shows through. The mealy grain of the prints is due to having bath too cold, under 70 degrees, and drying in a cold room. Take care and see also that the paper is not dry and horny before silvering.

Q.—Mrs. J. R. P. writes: Can you tell me if the mercury solution used for bleaching negatives before intensifying is of any use after being used once, or can it be used on other plates. I look to the BULLETIN for this kind of instruction.

A.—The mercury chloride solution used for bleaching in the intensification process, is good as long as it continues to bleach, and the same solution may be used on many negatives. When it ceases to bleach it should be

thrown away; it is of no value to recover the mercury it may contain.

Q.—E. E. R. writes: Will you, through the BULLETIN, give me a formula for a paste for mounting photographs that will keep for two or three months?

A.—Make a paste of arrowroot of a thickness that suits your purpose and add 5 grains of salicylic acid to every pint.

Q.—W. B. C. encloses a pretty cabinet of a child, and writes: I send by this mail a child study for your criticism in lighting and posing, and should be glad to receive through the BULLETIN your suggestions, if any, and if it could be improved. Also tell me what make of orthochromatic plates are best for studio work? Again, does it affect the quality of the silver printing bath to make it acid after being once made neutral with ammonia.

A.—The picture you send is a very pretty pose for a child, but we think it would be somewhat improved if the head was raised a trifle, to overcome the flatness of the chest. The lighting is good in the high lights, but the shadows lack transparency; use a little light on the shadow side, say, from a small white reflector throwing the light upward at an angle. Take care not to use too large a reflector. Let us see your results again. We do not recommend any dry plates in these columns, but we have had good success with Vogel's Eoside of silver plates, giving plenty of time. Remember, in using any orthochromatic plates, they are much slower than the ordinary dry plates, such as Cramer, Seed and others of that kind. Making a bath acid after being neutralized with ammonia, does not affect its working qualities. If you have used much ammonia and the bath requires much acid to turn blue litmus paper to a red color, then the hydromatic (or argentometic) will no longer tell you how many grains of silver it contains, the ammonium nitrate also affects that instrument.

Views Caught with the Drop Shutter.

ROBERTS & FELLOWS, of Philadelphia, have dissolved partnership by mutual consent. The interest of Mr. T. C. Fellows has been purchased by H. L. Roberts & Co., and will in future be conducted by them at the Logan Building, 1305 Arch street, Philadelphia.

WE regret to note the death of E. J. Hunt, a photographer, of Federal street, Philadelphia, who died of cancer of the tongue on December 29th last. He was forty-seven years of age, and had suffered patiently from the malady for many months.

H. B. SAUL, photographer, of 2034 Third avenue, New York, had his studio damaged by fire on December 22d last; amount of damage unknown.

OSCAR DUMMER, photographer, 437 Sixth avenue, New York, had his studio damaged by fire on January 4th. Loss unknown.

E. M. HILL's studio, of Genesee street, Syracuse, N. Y., was damaged $800 by fire January 4th. Fully covered by insurance.

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EVENING POST JOB PRINT, N. Y.

NEGATIVE BY BY C. F. CONLY, BOSTON. HELIOTYPE PRINTING CO., BOSTON.

STUDY IN POSING.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. JANUARY 24, 1891. No. 2.

WINTER WORK FOR AMATEUR PHOTOGRAPHERS.

WHEN the sun loses actinic power in the fall, and when the rays of light that are actinic at all only show their influence during a short interval of the day, the amateur photographer should turn his thoughts to some of those manipulations in photographic processes that can be accomplished without solar light. And we do not mean that he should degrade the art he professes to follow for love (amateur, from *amator*, a lover) by making pictures for his friends at some figure that covers the cost of materials, when they can afford it and are too mean to employ a professional photographer to do the work. There are a hundred and one points of interest in photographic work that will repay him for the time spent in the study of the difficulties they present to him. If he is of a mechanical turn of mind a look into the defects of construction in his camera and tripod, and rough devices or models of improvements, may be valuable to the camera-maker. Show these not with the idea that you are going to make money out of them—that is not the function of an amateur—but remember that every improvement in the means of art is helping art. Nevertheless, as a fact, there are few manufacturers who use an improvement that will not compensate the inventor and always give him the glory.

In the field of optics and the use of the lens there is a wide range of topics for thought and study for the amateur. The determination of the focii of the back and front lenses of his rectilinear combination, and a careful registration of the work of each ; the use and effect of different diaphragms in regard to sharpness of image and covering of plates, both with the single and double combinations. A careful note of the length of a line on the ground glass, when the object giving it is a definite distance from the lens, is also a very useful factor to know. All this work should be done carefully with some well-lighted object, such as a large card of print, or something that allows of sharp focusing, and without any regard to the use of the dry plate. This course of procedure will make the worker familiar with the appearance of the image on the ground glass when using the various optical combinations we have mentioned; and if results are carefully written down for future reference they save

much time from failure, and after a very few consultations of the note-book in connection with the use of the lenses the operator will become conversant with their capabilities without such consultation. In other words, having made a systematic study of the lenses, he knows what they will do without trials.

Coming now to dry plates and exposure, a series of experiments with these under determined conditions, and a careful record of the results obtained, would be a most interesting course of study for any amateur ; and when he had carefully collated his results he would be pleasantly surprised at the ease with which the work can be done and the satisfactory character of the conclusions. As is well known, the various numbers put upon the boxes of dry plates by the manufacturers have a certain value in their minds, but they are never in agreement with one another, and often give numbers widely different for plates of the same rapidity, but by various makers. Each amateur has certain brands of plates (the fewer the brands the better) that he has learned to use with more or less success. With all brands of plates will he have failures, because manufacturers are mortal. They don't make every plate personally, and workmen are careless under the best regulations. Taking a brand of plates and picking out those of low numbers of sensitiveness, expose them in a photometer. This last instrument is best constructed upon Vogel's principle (see "Progress of Photography," page 129, *et seq.*) and used in connection with a given weight of magnesium wire (not powder). By developing for a given amount of time with a new developer, and at a given temperature, a certain result will be obtained for this particular plate. It is best to use more than one test, and see that they agree. Then repeat the operation with another plate of the same brand, but higher sensitiveness, and note the relative action in each case. Remember that the Vogel photometer works upon the opposite principle to that of Warnerke, upon which most of the dry plates are rated by the manufacturers, the higher the number on the Vogel photometer, the lower the sensitiveness of the plate.

In the matter of development, a careful record of experiments with various quantities of developer and alkali, the time of development and the influence of a given rise or fall of temperature on the result, are points that need some earnest work from those whose leisure will allow them to undertake the tasks.

Intensification also needs more systematic work to be put upon it in connection with dry plate negatives. Here is a rich field for the amateur to cultivate, and the results under careful methods of procedure must yield most valuable additions to the art of photography.

The making of lantern slides and transparencies is also well worthy of careful study during the winter months. Not blindly following "the formula on the box," but carefully and systematically working step by step and noting, not guessing, the results.

In a few words, every amateur and earnest worker in photography should study his work, and in the same manner as the man of science. When a change is made in a method, the character of the change should be known precisely, and the results should be as precisely recorded. It is this miserable "as-easy-as-rolling-off-a-log" method that is retarding photographic progress ; and what we need are systematic workers, not the dilettanti and the wild horde that "press the button" and let somebody else do the rest.

If the officers of our societies would but lend their aid in this direction, we should see some better results.

EDITORIAL NOTES.

A GOOD dodge for improving a negative is to cover the glass side with ordinary negative varnish in a cold state, and then remove it from the parts which are sufficiently dense; the shadows may be blended into the lights by use of water-color, such as Prussian blue. Alcohol will quickly remove the entire coating if desired.

PROFESSOR J. ALFRED SCOTT, of England, has produced some beautiful specimens of toned positives for lantern work by immersing the positive in a 1 or 2 per cent. solution of potassium ferricyanide and a 6 per cent. solution of uranium nitrate, the tone passing from a brown to red, as the time of immersion continues. To change the color to an opaque blue it is only necessary to flood the negative with a solution of ferric chloride. The opaque blue may then be made transparent by immersing in sodium thiosulphate.

AT the annual meeting of the Syracuse Camera Club the following officers were elected for the year: *President*, JOHN D. PENNOCK; *Secretary*, R. W. BELLHOUSE; *Treasurer*, SAMUEL W. ROSE.

WE are informed by the committee who have the matter in charge that the subject for the next year's prize of the Photographers' Association of America is to be Elaine, from Tennyson's "Idyls of the King." The subject is one which will give wide scope for imaginative and beautiful effects.

IN this connection we note that Miss Catherine Weed Barnes has lately completed a good group picture which she calls "A Study in White." This picture will be exhibited during the coming exhibition in Vienna.

THE Agassiz Association have arranged to give an exhibition in the early part of next month, members competing, at which prizes will be awarded for classes as follows: Portraits, groups, genre pictures, landscapes, scientific, architectural and mechanical photographs. Also for the best exhibit as a whole, and for the picture popularly selected as "best." The judges are well selected, and the exhibition promises great things.

IT seems to be pretty well established that oxygen cylinders are not apt to explode from violent concussion, as not long since one was dropped from the top of a cab to the sidewalk with no more effects than to frighten the operator, who was inside, almost to death. And yet we frequently read of the bursting of cylinder-gauges when in use.

THE Lynn Camera Club have just elected the following officers for 1891: *President*, W. H. DREW; *Vice-President*, J. N. SMITH; *Recording Secretary*, J. W. GIBBONEY; *Corresponding Secretary*, A. J. PURINTON; *Treasurer*, E. F. BACHELLER; *Librarian*, A. H. CARSLEY; *Executive Committee*, W. B. GIFFORD, one year, W. A. PEVEAR, two years.

WE notice that Messrs. Cocanari, of Rome, have opened, in connection with their store, six dark rooms, the use of which they extend to tourists visiting

the City of Rome; and also that the Hotel Les Bains, at Montreux, Lake Geneva, Switzerland, has established a dark room for its guests—and certainly it would be hard to find a locality abounding in more beautiful and picturesque spots for the photographer than either of these.

We are in receipt of a collection of views from M. C. M. Dodd, of Washington, D. C., made by his daughter, on films, and which, so far as good qualities go, are quite equal to anything we have seen on glass. The posing and points of view shown in this work are both excellent and deserve great credit.

The officers of the Photographic Society of Chicago for the coming year are: *President*, Judge James B. Bradwell; *1st Vice-President*, James H. Smith; *2d Vice-President*, Gayton A. Douglass; *Executive Committee*, Bernard Eichelman, J. Maul, Chas. E. Smith; *Treasurer* and *Secretary*, C. Gentile. These officers have a heavy responsibility resting upon them, as under their time of service will come much of the preliminary work of the city in connection with the Columbian World's Fair Exposition.

We learn with deep regret of the bereavement which has overtaken our good friend Mr. J. Traill Taylor in the loss of his wife, who died on the 23d of December, from pneumonia, and would extend to him our hearty sympathy in his heavy sorrow.

It would seem from indications thus far, that this country will be well represented at the forthcoming exhibition in Vienna. It is advised that prints be sent unframed, but mounted, and each print larger than $3\frac{1}{4}$ x $4\frac{1}{4}$ must be mounted separately. Exhibits may be sent to Mr. C. F. Eckhardt, 32 Aldermanbury, London, E. C., or to the Committee of the Vienna International Exhibition, at the Imperial and Royal Museum of Arts and Manufactures, Vienna. Applications for admission must be in Vienna by February 1st, addressed to Carl Srna, Esq., Club of Amateur Photographers of Vienna, Wallfischgasse 4, Vienna, Austria. The New York Camera Club expect to have a good representation, and it is to be hoped that other clubs will fall into line at once.

A new method of rendering paper waterproof has recently been successfully introduced into its manufacture, which is based on the principle that the exposure to light of bichromate of potash, in conjunction with gelatine, will make the latter insoluble, when it can be made to withstand moisture and a considerable heat as well.

An instrument has just been placed before the French Academy of Sciences which is capable of producing fifty negatives in five minutes. It is claimed that in a series of exposures made on two fencers, one of whom was disarmed, this instrument produced eight negatives of the foil before it could reach the ground.

The Panoramic Printing Machine, which prints from a negative directly upon a continuous web of sensitized paper, which is then developed, fixed and washed, at wholesale, so to speak, bids fair to be introduced to a considerable extent into commercial printing as an aid in producing book illustrations without the time, labor and expense which is so often a desideratum in working from plates. If

the apparatus can be perfected, and some kind of paper produced which is not too expensive, it would seem to be perfectly feasible.

It appears in view of the many objections which have been raised by people in public life against the promiscuous display of their photographs, and the reproduction of the same for all kinds of advertising purposes, that the State of Illinois has passed a law prohibiting the sale of such pictures without the written permission of the originals. How far this law is capable of enforcement is a matter of question, though it is without doubt time that something was done to protect the rights of the individual sitter.

The recent decrease in price of pyrocatechin is bringing it into prominence as a developing agent. The formula below is simple, and is said to produce excellent negatives.

Pyrocatechin	1 gram.
Carbonate of potash	10 grams.
Distilled water	60 to 70 c.c.

The suggestion comes from the other side that as the best lime cylinders for use with the mixed jet of the lantern are the hard ones, which are supposed to have obtained their hardness by close proximity to volcanic heat, the same quality of lime may be obtained from ordinary marble chips, and one writer claims to have obtained good results from the use of such chips, having previously baked them thoroughly for twenty-four hours to eliminate the moisture contained.

The fact that, under the influence of light, yellow phosphorus is converted into the red allotropic modification which is insoluble in carbon bisulphide, has led to some interesting experiments in printing by means of these agents. A glass plate or lithographic stone is flowed with a solution of phosphorus in carbon bisulphide and allowed to dry, after which it is printed under a negative for a half hour, which produces a faint red image. The plate or stone is then washed off with carbon bisulphide, which acts as a fixative. Immersion in either a silver nitrate or copper sulphate solution will convert this image into a silver or copper positive, or if paper moistened with either of these salts be applied, the image will be found transferred thereto. Further experiments in that direction are looked for with interest, but in all such experiments it must be borne in mind that phosphorus is very highly inflammable, and *great care* must be exercised to avoid combustion.

Professor W. H. Pickering, of Harvard College Observatory, writes us to change his address for the Bulletin to Arequipas, Peru, South America, where he is to be located with an expedition to do astronomical work in that section of the world. We wish the Professor good health and every success in his interesting work.

The honor pictures at the recent exhibition of the Photographic Society of Philadelphia were from negatives by Dr. Charles L. Mitchell, John G. Bullock, Robert S. Redfield and Clarence B. Moore. The pictures were chosen by a vote of the members.

HOW TO WORK THE CARBON PROCESS.

BY P. C. DUCHOCHOIS.

We have described in the Bulletin, Volume XXI (1890), pp. 652 and 653, the failures occurring in the carbon process by employing for the development of the images water at improper temperatures. In this paper we will describe the causes of the other failures and give instructions, some of them seldom found in text-books, for working successfully. We were induced to write this complement to the former paper by the now very great importance of the process in question, resulting from its numerous applications in the decorative arts, photo-engraving, etc., and also to the printing of the diapositives employed for projections illustrating scientific demonstrations and lectures on æsthetics, travels, etc.

The carbon process is very simple, indeed. The instructions so far as the manipulations are concerned would go into a nutshell, thus: A sheet of paper coated with colored gelatine called "tissue," is sensitized by being imbued with a solution of a chromic salt, and when dry exposed under a cliche; then wetted in cold water and squeezed into contact on a flexible or rigid support; then immersed in warm water in which the paper is loosened and removed, when by increasing the temperature of the water the non-acted-on gelatine is dissolved, leaving the photographic image behind. If the support is a sheet of paper coated with insoluble albumen or gelatine, the operation is at an end; if it is a glass plate, a diapositive is the result. It can be transferred on to paper.

For diapositives a special tissue is manufactured abroad. It is imported into this country by the publishers of the Bulletin, in quantities for which they have a ready sale, *bis repitita placent*, so that the tissue is always fresh, that is, not much desiccated and quite easy to work. This tissue is sold in rolls 25 x 360 inches, which is rather a large quantity for amateurs Why not have it packed in half rolls, or even in, say, one dozen 8 x 10 sheets, which would be most convenient? We are pretty sure that the real amateur who will once make his lantern slides in carbon will never make them hereafter by any other process.

Sensitizing.—The tissue is sensitized by immersion in a solution of potassium bichromate of 2 to 5 per cent. The degree of concentration of the bath is important. The tissue sensitized in a weak bath is less sensitive and yields more contrasts than when prepared in a strong one. The former should consequently be employed for printing weak negatives, and the latter for those which are intense. A bath made of 30 grains of potassium bichromate and 1000 c.c. of water free from organic matters, to which may be added 5 c.c. of aqua ammonia, is used for printing negatives of the ordinary intensity, the tissue being then practically of the same sensitiveness as silvered albumen paper not fumed and insolated to obtain a print not over-exposed.

The time of immersion has also its influence. The less the tissue is allowed to absorb the solution the less chromic salt is absorbed and the less sensitive is the tissue, and there is also more tendency of the half tints to dissolve during the development. Generally the tissue should be immersed until it lays flat and commences to curl up in the solution, unless white and black impressions are desired. But then a bath of 2 per 100 is preferable, for by leaving

the tissue for a short time in the solution the ground of the image is liable to be spotted.

The bichromate bath should be renewed often and kept in the dark. It is employed at the temperature of 15 degress C. by being cooled in a freezing mixture in the hot season. At 20 degrees C. the proofs are more or less reticulated ; about this temperature the gelatine softens and may dissolve.

The addition of alcohol to the solution of bichromate has been recommended in order to hasten the desiccation of the tissue in warm and damp weather. This is objectionable. The spirit tends to reduce the chromic salts, which are transformed into the green compound, and the result is partial or complete insolubility of the gelatine.

The bichromated tissue is insensitive while wet; the development and the sensitizing can therefore be made by daylight. But the drying after sensitizing should of course be done in the dark room. A candle-light or daylight filtered through an orange glass will do for the lighting of the room.

Caution.—The soluble bichromates are poisonous. They act by absorption, producing chronic skin diseases. In working the carbon process, or any other in which a chromium salt is employed, one should protect the fingers with india-rubber tips.

Drying.—The tissue must be dried in a current of cold air. If it dries rapidly it adheres well on the support and yields most brilliant images which are easily developed. On the other hand, should it be allowed to dry slowly the adherence would not be so perfect, the images dull, developing with difficulty or not at all, and generally reticulated. This specially happens in warm weather. When the temperature is at 30 degrees C. or thereabouts, the gelatine softens, sets on itself and produces a reticulation which spoils the tissue. Moreover, the gelatine becomes in this case generally insoluble and even dissolves if dried in the air.

The writer always dries the tissue in the following manner, which he devised about fifteen years ago, and was published in the Bulletin. Not only is the least trace of reticulation avoided from the cause in question, but the tissue drying quite flat lays in perfect contact on the negative, which is a *sine quâ non* to obtain proofs sharp all over :

A glass plate free from scratches is flowed with

Benzine, pure	150 c.c.
Yellow wax	2 grams (Filter)

then strongly heated, allowed to cool and rubbed clean (apparently) with a small piece of flannel. This is repeated three times when the plates are new. If they have been already used it can be repeated twice only.* The plate is then coated with the following plain collodion :

Ether	300 c.c.
Alcohol, 95 degrees	400 c.c.
Pyroxyline	5 grams (Filter)

When the collodion film is set, the plate is immersed in filtered water until greasiness has disappeared, when on its removal from the bichromate bath the

* Instead of waxing, the plate can be rubbed with talc or coated with a solution of india-rubber in benzole, 1:90.

tissue is placed upon it and squeezed into contact, taking care to remove air bubbles. The tissue is then allowed to dry in the air on the collodion film in the cold season, or, when the weather is warm and damp, in a box in which is a quantity of quicklime in earthen dishes. When *quite* dry the plates are placed one upon another, packed in tinfoil and kept in a dry closet. The tissue should be stripped off only when wanted for use.

The room in which the sensitized tissue is dried and kept must be free from sulphuretted emanations, either from the combustion of coal gas, coal, from water closets or any other sources, which by acting on the chromic salt make the gelatine insoluble, exactly as when the tissue is exposed to white light. It is said that the products of the combustion of petroleum, acetylene, probably, are equally injurious.

(*To be continued.*)

PHOTOGRAPHIC STUDIES OF CHILDREN.

BY ADELAIDE SKEEL.

"No babies or little ones allowed as models in this studio," said the professor to his photographic class, and he looked at me. He, certainly, was a mind reader, for when I found I was not to be shown how to take the boy whom I saw outside in the street in an empty molasses barrel licking it emptier, nor the black-pin girl with the ragged baby in her little tired arms, I went home and, by unaided intellect, made these studies which are given below to explain how much and how little one can do out-doors, without sky-light, head-rest, mechanical baby-charmer or other helps.

In the first place, and in the last place, I confess I am one of the story-telling kind, and, while fully appreciating the great necessity of mastering technique, I hold the expression of an idea higher than the testing of a shutter or new developer. Without more preamble, then, I may say I longed to illustrate a bird's burial; Gosse's villanelle ran in my head to the exclusion of special eikonogen formulas:

"Little mistress mine, good-bye,
I have been your sparrow true;
Dig my grave, for I must die.
In your garden let me lie,
Underneath the pointed yew;
Dig my grave, for I must die."

Disregarding the "pointed yew," because the tree is not found on the banks of the Hudson, I set up the machine on a cloudy day in front of a leafy background and sharply focused with large stop on an open book lying in the middle distance. This gave the desired blurred-screen effect behind the figures, for I have learned to my cost that the tendril of a vine which looks pretty to the eye comes out in horrible horn-like effect against a sitter's ear or cheek if he be near the foliage.

The next thing was to summon the children, which was done by going directly to them and offering to pay cash if they would sit. This is easier and cheaper in the end than oft-broken promises of the pictures themselves when

finished, as little boys especially know the value of money at a very early age; and, although they like well enough to pose as long as the novelty lasts, as soon as they learn how their patience is gone, and only pecuniary inducements will keep them. A little experience will teach the amateur which of a family will pose the best, and one is not twice misled into choosing curling hair or rosy cheeks in preference to well-shaped limbs and lithe, graceful figures; but above all I look for a quick sympathetic understanding on the part of a model, and in the "bird's burial," given in outline herewith, the child with her apron to her eyes felt and showed a real grief for the supposed pet, which happened to be a dummy made for the occasion out of a milliner's bonnet decoration! One must avoid, of course, the common error of getting unequally sized figures by placing them at widely different distances from the camera, and also the conventional fault of the local photographer of standing all in a row. Interest should center on the figure to which the eye is led by the lighting and by the pose of the others in a curve something like this

Point of interest is the cage.

and if any of the less important children happen to have on an apron or light dress which diverts the mind by its brightness, do not hesitate to remove it, unless you wish to have it "swearing" at you in the finished print. In an outline, such as the above cut, it makes but little difference. Again, in an outline it makes but little difference if the lens is strained to get figures larger than they should be, but avoid this in a photograph in which all the distortion must show. This is only a guess of mine, and not worked out by any law of optics, but generally speaking a figure should not be more than one-third the length of the plate if a lens is used only to cover the plate in use. Moreover, to fight against under-exposure, it must be kept in mind that the nearer the object the longer the exposure, and *vice versa.*

To return again to the aid an imaginative child is, I must put in a caution about diverting one's own mind by too much entertaining talk to the subjects, and

suggest that a helper gifted in talking to children, a sort of kindergarten teacher in photography, be employed to be agreeable while the operator is actually taking the picture, and thus escape the putting of two or three groups on one plate. She tells the children what "we are playing," and their easily fired enthusiasm becomes red-hot. In cases of abnormal dullness, badness or preternatural goodness, when the child positively cannot or will not do as he is told, it is well to give up all preconceived ideas and take him doing anything or nothing, and thus sometimes secure an entirely original and unartificial pose. It was in this way we got

the audience as given on preceding page; also before a leafy background, but in full sunlight. I despaired of them because they could not keep still, so, letting them "wink as freely as they pleased, and look pleasant or the reverse," we made a low success. Of course, the mothers were outraged not to see the sweet faces, but I wanted to get a picture of "playing church," and here is a part of it. "The church," "the minister," "the steeple," will come later, and this is only "all the people."

"Ride a cock-horse" was not all my fancy painted it, because the riders were afraid of the horse, and had to be held on by some one till the moment of taking, but the clinging arm of the older sister about Baby has, to my mind, quite as much expression as her face. This girl was not a poet, and did not readily lend herself to our tableau, but she was careful that the little one should not be killed to please us, and she shows it in every curve, does she not?

The last attempt, "the five o'clock," was taken of two almost professional models, the little girl having been photographed by an enthusiastic relative twice a week and six times on Sunday ever since she was a month old. They knew all about it, and, scorning remuneration like true amateurs, gave us many valuable points as to their usual pose. It is so common a subject that one feels like apologizing for its conventionality, but the excuse for taking it lies in the fact that the children were really playing when we found them, and as it is so seldom one can catch boys and girls in naturally artistic poses and hold them, we seized the chance. Of course, such pretty attitudes are taken a thousand times a day when no one is looking, but as surely as a photographer approaches, be he ever so wary, stiffness takes the place of grace, and the charm is gone. Every one in the group places himself in a line before the camera, and after a little quarreling for "best places," with a concentrated stare at the uncapped lens, the cry goes up, "Take me." In the "five o'clock," the well-trained models went on with their play, and as they happened to be placed against a side hill we got a nice background. A little more care in setting the tea-table would have brought out some of the dishes better, and a little more to eat on the festal board would have looked more agreeably realistic. The only way I know to get a natural pose in a group of children whose play one wants to sketch, is to look and remember, and later to place the same children or other ones as they were placed when first seen. It is strange, but otherwise one finds himself relying almost entirely on pictures, as if no real live flesh-and-blood boys and girls had ever played tag or "puss in the corner" in the neighborhood before our eyes.

The illustrations in this article are photographed from outline pictures, printed directly from the negative on "blue" paper, which have been previously carefully traced in India ink and then bleached in a bath of sulphite of sodium—one ounce of the sodium to sixteen of water—followed by another in a weak dilution of muriatic acid—five drops of the acid to three or four ounces of water. Care must be taken not to outline too heavily or too lightly any essential parts,

as in either case the effect is unfortunate when reproduced in the photograph. Moreover, any part may be left out in the inking—the leafy background in these views—and a simpler picture, as well as a cheaper one, for reproduction thus obtained.

[*From Photographisches Wochenblatt.*]

MICRO-PHOTOGRAPHY.

BY DR. R. NEUHAUS.

PROFESSIONAL photographers as well as amateurs would doubtless pay more attention to photographing microscopic objects if they knew how easily a thorough knowledge of micro-photography can be obtained with the present available and complete resources, and at comparatively little expense.

To scientists a great service would be rendered, particularly if professional photographers would take the matter in hand. Botanists, anatomists and bactereologists generally very seldom find time to photograph personally their very perishable preparations, produced with great care; and if the photographer lends here a helping hand, the photographic picture in scientific works will at last take that position which it deserves.

In the following we will try to show with how few resources actually faultless pictures can be produced that will satisfy any pretensions.

The objects mostly needed are a microscope and a photographic camera. If the latter has a bed of only 1 meter in length it is satisfactory for almost all cases, although the professional photographer has generally cameras with considerably longer bellows at his disposal. A short camera can easily be lengthened with very little expense by a pasteboard cone fastened to the frontboard.

The second important requirement, a good microscope, might not so easily be found in photographic studios, but the scientist will undoubtedly in most cases place his instrument at the disposal of the photographer for this purpose when he desires to have his preparations photographed. But even if this should not be the case, it is not difficult at the present time to obtain a good instrument with the necessary objectives and oculars at a comparatively cheap price.

It is by no means necessary that the outside of the microscope should have an imposing feature, but of principal importance is its stability. In this regard the medium-size instruments of Hartnack, in Potsdam, can be recommended.

Since the introduction of apo-chromatic objectives every micro-photographer regards it as a necessity to work with these pretty expensive glasses. But, without the least intention of reducing the advantages of the apo-chromats, we have to remark that micro-photograms can also be faultlessly produced with the ordinary cheap objective. To throw the picture on the ground glass the projective ocular of Zeiss is now generally used; but the same purpose can be attained with the ordinary ocular, if changed in the manner as prescribed by the writer.*

Camera and microscope should be placed upon separate tables. By this arrangement any vibrating influence of the camera upon the microscope is avoided when the holder is inserted and the slide is drawn. The best light-tight connection between tube and camera is produced by a double cap (pasteboard or brass), which is put upon the tube, and into which can be pushed a case fastened to the microscope end of the camera.

* Neuhaus, Text Book of Micro-photography, Brunswick, 1890.

As soon as the ground glass is more than a distance of from 50 to 60 centimeters from the ocular, provision must be made for a prolongation of the micrometer-screw, which cannot be reached with the hands. The so-called hook-joint is used for this purpose. The prolongation of the micrometer-screw for any camera length can be produced with very little expense. Two cords, running on rollers alongside of the camera, are connected with a cramp-hook, which is fastened at the head of the micrometer-screw. Each pull on the cords effects a turn of the micrometer-screw.

Of the greatest importance for successful pictures is the proper regulation ot the illumination. For all dry systems of lenses, a larger condensing lens or the connection of such a one with a small plano-convex lens is sufficient.

As a light source, we employ almost exclusively the kerosene-oil lamp. Even for a thousand times linear enlargements there is no longer exposure needed than five minutes. The sunlight, which was almost the only light source for the micro-photographer at the time of the less sensitive wet plates, is to-day used only in the most difficult cases of diatoms. For the smallest living objects the magnesium light does excellent service.

For several reasons the orthochromatic plate surpasses the ordinary dry plate, and of these the erythrosin plates, which can easily be obtained by bathing ordinary plates in erythrosin solution, proved to be the best. The development of micro-photographic negatives is the same as that of an ordinary portrait or landscape plate.

Many may assert now that without a full knowledge of the preparations it is impossible to produce a good photogram. This is not the case. The photographer Grimm, in Offenburg, has proven by his excellent photograms that the above-mentioned difficulties can be easily overcome, and it is to be hoped that more professional photographers will profit by their practical experience and engage in the service of micro-photography.

THE PHOTOGRAPHIC PROCESS.

BY CAPTAIN ARTHUR FREIHERR VON HÜBL.

(Continued.)

The reproduction of a painting can only then have an effect similar to the original, if photography renders the colors in their light-value, changing the scale of colors in such a way in gray-shadings that white and yellow appear brightest, blue the darkest.

This problem has at present been almost completely solved by the color-correct (ortho or isochromatic) photography. For the reproduction of colored objects the blue-sensitive plate is not used any more, but the photographic preparations are changed by certain additions in such a manner that they will suffer a change even by the less refractive rays.

As far as our experience has gone heretofore, these additions—optical sensitizers according to Vogel—must be changed chemically by those rays for which they are used to make the plate sensitive. To make a photographic plate, therefore, sensitive to yellow rays, a substance has to be added which will suffer decomposition by yellow light. If the ray of light changes a substance chemically, it must disappear as such to our eye, its energy being changed to chemical

force, and such rays can therefore act only chemically which are optically absorbed. The so-called optical sensitizers are therefore wanting in the kind of rays in their absorption spectrum for which they are to make sensitive the photographic preparation; they will appear, therefore, colored in themselves, and will show a color which is complementary to the one for which they sensitize. But from this fact we might infer that each colored body should possess a sensitizing action ; yet, because the absorbed rays of light may suffer also another change—they may, for instance, be turned to heat—the substance will then experience no chemical decomposition, and will therefore not sensitize.

The expression "optical sensitizer" does not conform with these views about the action of coloring matters, as this is not explained by a change of the ineffective rays by an optical proceeding, but, on the contrary, the opinion prevails that the chemical change of the coloring matter was absolutely necessary. The designation "color sensitizer" would perhaps be conformable to the purpose before the mechanism of the sensitizing by coloring matters is explained.

Although chloride, bromide or iodide of silver have practically only a value as "blue sensitive," they still suffer a change by rays of every other color if the exposure has only been of sufficient duration. The different modifications of these bodies, true enough, behave differently in this regard, but in general the two first ones surpass the iodide of silver very considerably. By the addition of a chemical sensitizer the sensitiveness is not only increased for blue, but also for all other rays.

If light-rays of different color are thrown upon a photographic preparation mixed with a coloring matter, as, for instance, upon a mixture of bromide of silver and cyanin, the bromide of silver, principally under the influence of the blue rays, will separate bromine, and the latter will, by the absorbed (in this case) yellow rays, suffer an accumulation of the atoms for new compounds.

If the photographic preparation is already incited to decomposition by yellow light, a decomposition of the bromide of silver may be caused if the motion occasioned by the accumulation is sufficiently energetic and if the contact with the coloring matter has been intimate. This is also changed by the blue rays directly, and by the yellow rays with the aid of coloring matter, in such a way that black coloration reduction takes place at the subsequent development.

Iodide of silver being hardly excited, even after longer exposure, by the less refractive rays, this preparation is wanting in the tendency for decomposition by yellow rays ; it can therefore not be sensitized for these even by coloring matter. Chloride and bromide of silver molecules, on the contrary, are easily excited by all kinds of rays, and this excitement is in such a manner increased by the motion of the decomposing coloring-matter molecules that a chemical change of the same takes place.

An addition of iodide of silver decreases the sensitiveness peculiar to the choride and bromide of silver for these rays ; it counteracts therefore the sensitizing capability of coloring matters just so much as it reduces the general sensitiveness of the bromide of silver emulsion, or as an addition of chloride of silver will injure the sensitiveness of the wet iodide of silver plate.

The tendency to decomposition peculiar to a photographic preparation is increased by the presence of a chemical sensitizer, many coloring matters acting therefore only as sensitizers when such a body is added. (Dr. H. W. Vogel, "The Photography of Colored Objects.")

But if the general sensitiveness is increased too much by such additions, the admissible short exposure will not any longer be sufficient to effect a decomposition of the coloring matter, and the sensitizing will, therefore, hardly be observed, or not at all. Bromide of silver gelatine plates, for this reason, can therefore be sensitized only very incompletely by coloring matters; they contain an extremely powerful sensitizer, and under its influence are changed so rapidly by the blue rays that a continuation of the exposure is out of place, and such would be necessary if the coloring matter is to be effective. Collodion emulsions, on the contrary, which are void of such a powerful sensitizer, can be sensitized excellently by coloring matters.

The easier a coloring matter will decompose by the action of light, so much more powerful will be its effect. Cyanin and chlorophyll act therefore excellently—they are two bodies very inconstant in light; and eosin with nitrate of silver acts considerably more than eosin alone, corresponding with the higher light-sensitiveness of the mixture. The eosin silver produced with eosin in excess bleaches in light just as inactively and slowly as eosin alone, and the effect of both sensitizers is therefore the same. The eosin silver precipitated by excess of silver possesses however essentially other properties.

The relation of the silver salt of eosin is altogether quite analogous to halogen silver; its light-sensitiveness for yellow-green rays is increased by nitrate of silver or alkaline substances (ammonia), and is reduced by free eosin. If for instance a collodion emulsion is colored with eoside of silver its sensitiveness for yellow-green is very small, but if a little nitrate of silver is added it increases considerably, but it is again almost destroyed if an excess of eosin is added.

An ammoniacal eoside of silver solution (Albert's sensitizer) acts very favorably, but it loses also its effectiveness as soon as an excess of eosin is present. Left standing for some time, this solution will deposit some silver in the shape of black flakes, and it contains then free eosin, or decomposition products of this coloring matter not united to silver. Such a changed sensitizer gives to the collodion emulsion only a very small sensitiveness for yellow-green as well as for blue rays; but as soon as the free eosin is bound by some nitrate of silver, the solution will obtain again its old properties.

As already mentioned above, there is a certain minimum intensity of the light rays for every light-sensitive substance, beyond which they will prove ineffective. For the coloring matters this intensity might lay higher in general than for the photographic preparations; for that reason a fully exposed picture is obtained in bad illuminations of the object, but without more or less orthochromatic action. The brighter the illumination, the much more effective the coloring matter. The best results are therefore furnished by solar illumination.

For the photography of the less refractive rays there seems, besides the easy changeableness of the photographic preparation and the light-sensitiveness of the coloring matter, also the intimate contact between both bodies to be of ruling significance. Chloride, bromide and iodide of silver bind many bodies—among them nitrate of silver and a number of coloring matters—in a similar manner to oxide of aluminium, which with coloring matters forms the so-called "lakes." To transfer the excitement upon the halogen silver, when the decomposition of the coloring matter takes place, an intimate contact of both must take place, and such a union is perhaps necessary for an undetermined relation. The mere coating of the photographic plate with a colored varnish-like film, as pro-

posed, leads to no satisfactory result, the decomposition of the coloring matter resulting at a place separated from the halogen silver. If the coloring of this film has been sufficiently intense, the effective rays are absorbed in it; they do not reach at all those bromide of silver particles which are in immediate contact with the coloring matter, and the orthochromatic action ceases entirely. In a similar manner acts also the too intense coloring of an emulsion—the colored collodion or the gelatine preventing the access of the effective rays to the colored bromide of silver.

The plates sensitized by coloring matters, which are at present employed, render the blue too light in the reproduction, and besides this their proportionate sensitiveness to green, yellow and red rays is never adequate to the natural light-value. Yet completely satisfactory results may be obtained for practical purposes.

(*To be continued.*)

GUAIACOL AS A DEVELOPER.

By Colonel J. Waterhouse, B.S.C., *Assistant Surveyor-General of India.**

Guaiacol, or methyl catechol, is a constituent of beech-tar creosote, and, according to Watts, belongs to the class of dihydric phenols which includes pyro-catechin or catechol, resorcinol and hydroquinone or quinol. All these substances have a more or less strongly marked power of developing the latent photographic image on plates prepared with bromide of silver, and it seemed likely, therefore, that guaiacol might act in the same way, and be an efficient and cheap substitute for pyro-catechin. As I could find no record of its having been used as a developer, I procured some from Europe, and, although I have not had leisure to try it thoroughly, it is satisfactory to find that it is capable of developing gelatine dry plates fairly well, though it is somewhat slow in action, and does not appear to have the same power of bringing out detail in the shadows as have hydroquinone or eikonogen.

Guaiacol is a colorless oil, with a rather peculiar tarry smell, and is obtained by distillation from beech-tar creosote or by dry distillation of guaiac resin, and also from pyro-catechin and other substances. It is only slightly soluble in water, but dissolves readily in alcohol, ether, acetic acid and solutions of the alkalies and alkaline carbonates.

I have tried it as a developer in the proportion of 10 minims to the ounce of a solution of carbonate of soda (crystals) at about 4 per cent., and of 15 minims to the ounce of a solution of caustic soda at about 1 : 80. These solutions when fresh have a slight green tint, which turns brown on exposure to the air or after development. Negatives develop clearly in both of these solutions, but slowly, though the action was quicker in the stronger developer. Unless the development is very much prolonged, they do not stain the film, but there is no tendency to fog, and bromide is quite unnecessary. The resulting negatives were not very dense, but were of a good non-actinic yellowish-brown color, something the same as those developed with similar solutions of pyro-catechin, but not nearly so intense. After development the solutions become much more strongly colored, and take a very strong resinous smell, which though not really

* From *Journal of the Photographic Society of India*, by kindness of author.

unpleasant is strong and very persistent, sticking to the fingers for some time after developing.

Guaiacol enters into combination with the alkalies, forming crystalline salts, which darken on exposure to air and moisture. It is possible that, if these compounds could be prepared in a dry form, in such a manner to be capable of being kept in good order for some time, they would form very convenient developing salts for travelers, it being only necessary to dissolve a sufficient quantity in water as required for developing.

I hope to make further trials in this direction, and report the results in a future paper.

I have also tried pyro-catechin, and find that it seems a very promising developer, giving great intensity and brilliancy without stain or fog, so that it might be very useful for copying work, but its high price, 4*s.* a dram, is against its use. Guaiacol is very much cheaper, being only about 1*s.* 6*d.* an ounce, but so far as I can see at present has no special advantages which would cause it to supplant the already well-established developers, though its being less liable to decomposition from keeping than pyrogallic acid, hydroquinone or eikonogen, and its property of forming salts with the alkalies, may make it useful. Its smell will be against it, though it may act as a deterrent to mosquitoes. In any case, it is interesting to know of a new developing agent in a liquid form, and I hope to be able to give further information regarding it.

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

Chapter VII.—The Study of the Face.

(*Continued.*)

Thus this furrow must always be subdued somewhat, but never totally removed, as an indication of it must always remain to help the expression of the eye. Those markings above it will require but little modification ; should they by any means become too much diminished they impart a dead appearance to the eye. This should suffice for the treatment of the confessedly most difficult organ the retoucher can be called upon to exhibit his skill. I trust these remarks will be found comprehensive, as they are intended to be, for the full manipulation of the eye ; although, once more let it be clearly understood, the less done to this feature the better. We can now pass on to another organ, one which seldom meets with due consideration from retouchers, and seems to be totally neglected by most photographers, yet still deserves as much attention as any other portion of the head.

This neglected feature is the ear. I cannot see any reason why it should be such a matter of indifference, not only to retouchers and photographers, but even to many artists. A close inspection of the productions of some of our most eminent photographers will, however, convince one that the ear has been to them a subject of the most accurate study. The argument of those who neglect this organ is simply that being without expression, and not an intellectual feature, it does not contribute a resemblance. Against the former portion of this argument there is little, if anything, to advance, but the latter, on close examination, can scarcely be considered accurate. The judicious posing of a head, whereby the ears are kept in their proper places, may not show them as at all aiding the likeness ; but let us fancy the reverse of this. How many otherwise good pictures have we not seen totally spoiled by the thoughtless posing of the head, which brings the ears into prominence, and really imparts to the

head an appearance that the oldest friend would fail to recognize? Is not this practically injuring the likeness?

Neither are all ears alike; and this fact alone should be sufficient to ensure for them some small measure of attention, as it must also prove to an extent that they must frequently contribute somewhat to resemblance. This feature when represented in full light—as, for example, in profile portraits, and to a somewhat less extent in three-quarter faces—demands great nicety and precision in its treatment, whereby the exaggerations of photography usually apparent in the ear may be modified. Attention should be given to preserve the natural softness of the lobe, and the upper cartilaginous surfaces should be very tenderly treated.

In three-quarter and full-face views of the head, the retouching of the ear may contribute much to the perspective, while in profile it may be so handled as to give breadth and rotundity. It is not a very unusual thing to see the ear of a grown-up person, through thoughtless treatment, so badly distorted as to appear quite round and plump, like that of a child. Now, as the ear elongates as we progress in years, this effect should be modified in harmony with the rest of the face; and this is to be accomplished by increasing all the perpendicular cartilaginous lights, and thus give less breadth and better form to the ear. Of course, all these details should be carried out in such a delicate and skillful manner as not to result in giving undue prominence to this feature, for such would interfere largely with the excellence of our picture. There is not much more we can say upon this feature, save and except, perhaps, that the utmost care and thought should be used when treating it, also to leave it in as much half tone as possible, and so not attract the attention away from the other features, which to a greater extent hold the individuality of the face. This is a very essential point.

In working up a head, the preservation of half tone should ever be a primary consideration to the artistic retoucher, for without it his skill will never be properly appreciated. Half tone in a monotint (I presume we may class a photograph as such?) is what color is in a painting. Besides, it is in the half tones and shadows that our work will show to the greatest advantage. Even when a negative does not possess much half tone we should try to create it by the skillful working up of the lights, and thus gain by contrast what we had not before we started work. Of course, all this is legitimately part of the retoucher's work, for I hold it, after all said and done, the object to be gained (by the united efforts of the photographer and retoucher) is a satisfactory and artistic picture. And where, through one cause or another, the operator in his negative may have failed to secure variety of light and shade—in most cases not his own fault—we must, as I before said, struggle to perfect them by securing as much half tone as is possible, and which is often only practicable by forcing up the lights and so procuring contrast.

The most casual observer will not fail to appreciate what an advantage it is when a certain degree of half tone pervades a photograph. It is this half tone distributed down the side of the head that gives not only the form to the cheek and shows up the ear to the greatest advantage, but also gives shape and intellect to the forehead, which without it would be a white unseemly patch from one side to the other. Besides, without half tone where will be the roundness of nature in your picture? What an advantage, too, will not a delicate shade be on the light side of the nose. Indeed, when we have it not, we should force a light on the cheek and also on the bridge of the nose in order to procure a little half tone. Since that is so, how careful should we be to preserve it when the skillful operator gives us a negative full of such useful detail! Notwithstanding all this, there are numbers of thoughtless people who dash off retouching, and at each stroke of the pencil obliterate what to the skillful retoucher, possessed of artistic feeling, would be an object of the greatest value.

Fighting for dear life—The Adirondack hunter.

[*From the British Journal of Photography.*]

THE NEW BENZOLINE LIME-LIGHT.

BY ALBERT W. SCOTT.

Enriched Coal Gas.

The warm bath saturator described in the previous article can be used in two ways: either oxygen may be forced through it and coal gas altogether dispensed with, or coal gas may pass through the vessel in order to have its illuminating power increased. In the latter case very little gas is required, one-quarter of the usual quantity being sufficient; hence the saturator, used in this way, saves 75 per cent. of coal gas—an important economy when compressed-gas cylinders are used.

The most powerful lime-light is obtained by passing oxygen through the saturator, dispensing with coal gas and using nipples of about one-fourteenth of an inch bore on mixed gas jets. Under these conditions the following results were obtained: with oxygen in a 10-foot gas bag, placed under 2 cwt., the light was equal to about 700 standard candles; when the pressure was increased to 3 cwt., it amounted to 900; and with a gas bottle the maximum light was 1,350 candles. These are, of course, very great lights for lantern work, and for most purposes a lower pressure of gas would suffice; 1 cwt. on a large oxygen gas bag will give, with benzoline, a light that would be termed "splendid" by most lanternists, although possibly not more than 500 candles.

Benzoline will give as much light with 1 cwt. on the pressure board as coal gas would give with 2 cwt.; hence, a lighter pressure board can be used for general work, the wear and tear of gas bags is lessened, and the labor and nuisance of procuring heavy weights is diminished.

If benzoline is compared with coal gas, when both are arranged to give an equal brilliancy of light, it will be found that the benzoline lime-light uses considerably less oxygen than does the coal-gas lime-light, so that not only is coal gas dispensed with, but even the supply of oxygen is diminished. However, it should be borne in mind that one cannot have the full light of benzoline without giving as much oxygen as would be required for coal gas. If the two are arranged to consume an equal quantity of oxygen, and the conditions are such that the coal-gas lime-light is equal to 500 candles, it will be found that benzoline gives about 700 candles.

If absolute silence is required with a lime-light, the limit with coal gas is about 500 candles; with benzoline, 700 candles. If a slight hissing, inaudible at 30 feet distance, is not objected to, the limit with coal gas is about 600 candles; with benzoline, 900 candles. The noise increases with the pressure.

When light volatile benzoline is used in the warm bath saturator, dissolving can be accomplished without coal gas with ease; but it is desirable to dissolve slowly, a period of at least 3 seconds being allowed for the movement of the dissolving handle from one position to another. If the handle is moved with a jerk so as to change the view on the screen quickly, there is a chance of getting a pop, especially with large-bore nipples; and although benzoline is less liable to give pops than ether, it is not quite so safe in this respect as coal gas.

There is, however, a simple means of rendering these pops impossible, viz.: by passing coal gas through the warm bath vessel instead of oxygen. The saturation of the coal gas with vapor of benzoline is known in the gas trade as "enrichment," that is, the gas is rendered richer in carbon.

Enriched gas has been applied to ordinary fish-tail and bats-wing burners for many years—the albo-carbon system of gas lighting being founded on the same principle; but I believe I am the first to point out its value in connection with the lime-light, both for economizing coal gas and for increasing the brilliance of the light produced by large-bore nipples. With small nipples of one-twentieth of an inch bore, such as are often fitted to commercial jets, there is little or no gain of light produced by en-

richment, and with these the advantage consists solely in the lessened consumption of coal gas.

The percentage of economy obtained by enrichment varies according to the amount of vapor imparted to the gas. The warm bath saturator is capable of adding more vapor to gas passed through than any form of cold saturator; hence, it produces a correspondingly greater saving of gas and increased brilliance of illumination.

The lime-light obtained with enriched coal gas is not quite equal to that produced by enriched oxygen; it is, however, considerably brighter than that of ordinary coal gas. Speaking roughly, it may be said that, with a nipple of one-fourteenth inch bore, and with a certain fixed pressure of oxygen, coal gas gives 400 candles; enriched gas, with the warm saturator, produces a little over 500 candles; and enriched oxygen, without coal gas, gives about 600 candles.

The consumption of coal gas when enriched being so small, it is obvious that the expense and inconvenience of large bags and cylinders is diminished. One cylinder of coal gas will suffice for three or four similar cylinders of oxygen; or a twelve-foot bottle of coal gas would be a suitable size to go with a forty-foot oxygen cylinder.

Safety.—Letters are now reaching me by every post containing inquiries about the new lime-light. Most of these ask the question: Is it safe? To such I answer that they can hardly have an accident if they tried. One gentleman last week inquired whether I would advise the use of a cage with iron bars to put the saturator into, with the view of preventing the destruction which might be caused by the flying fragments of wool in the event of an explosion. As the saturator is already protected with armor, as it were, in the outer casing forming the air bath, I did not think the cage necessary. If an impossible explosion caused the inner vessel to burst, it is in the last degree unlikely that the outer vessel, made of stout sheet metal, riveted together, would also give way.

The same ingenious gentleman suggested that the saturator could be placed outside one of the windows of the hall, just below the window-sill, or on the ground, and connections made with the lantern by means of long pipes. He considered that this arrangement would be fairly safe. The idea is so clever that it is worth mentioning, for the benefit of those who have old, unstuffed, ether saturators in their possession. It would be as well to add the cage also, in case any stranger might be near the saturator when it burst.

To those who are at all nervous, and who wish to be absolutely safe, even from the smallest "pop," I can with the utmost confidence recommend the enriched gas lime-light with the warm bath saturator. Enriched coal gas is as incapable of exploding as the air we breathe.

CHLOROPHYLL AND LEAF-GREEN.*

BY W. N. HARTLEY.

THE author refers to the numerous memoirs on chlorophyll of Stokes, Sorby, Timiriaseff, Pringsheim, Reinke, and of Russell and Lapraik and Schunck. Having been occupied at various times during the last seven years in an investigation of the different coloring matters described under the name of chlorophyll, he has deemed it advisable to present his results to the society without awaiting the further development of the research. The subject-matter may be conveniently arranged under the following heads.

a. Observations on the spectrum of chlorophyll contained in living tissues.

b. The spectrum of chlorophyll as seen in dried leaves.

c. Mode of extracting leaf-green unchanged, and separating the blue from the yellow chlorophyll.

d. Measurements of the spectra of the chlorophyll.

* The *Chemical News*. Abstract of a paper read before the Chemical Society.

1. Living tissues which are fresh and young, and which, therefore, contain the leaf-green unaltered, exhibit no trace of a band in the yellow close to *d*, such as is usually attributed to chlorophyll, and there is no indication of one in the green. Complete absorption, just beyond *b*, extends through the ultra-violet.

2. Yellow chlorophyll has a distinct absorption band in the red, differing from that of blue chlorophyll. It has likewise a distinct fluorescence.

3. When light is concentrated on living tissues, the absorption spectrum of the green coloring matter is soon altered.

4. Separation of blue from yellow chlorophyll. The blue chlorophyll may be extracted from minced leaves by cold absolute alcohol, and may be precipitated by addition of baryta. The yellow chlorophyll is not so precipitated, or not precipitated so readily.

A warm solution of boracic acid in glycerine, mixed with a little alcohol, liberates the unchanged blue chlorophyll from the dried barium compound.

5. The blue chlorophyll exhibits two absorption bands in the red, close together; in the less refrangible reason of rays one overlies *b* and the other overlies *c*. There is a feebler band near *d*.

6. Concentrated solutions of yellow chlorophyll in benzine are brownish in color, and exhibit a magnificent red fluorescence.

When blue and yellow chlorophyll are separately treated with formic acid and ether, there are produced two new substances showing absorption bands in the green. It is believed that when these bands have been observed, either in preparations of chlorophyll or in living tissues, that the chlorophyll has been altered by oxidation of formic aldehyde in the plant. The oxidation could be caused in living tissues by an excessive degree of illumination, which causes the destruction of the tissues, and otherwise by exposure of the contents of the plant cells to air or oxygen. An excessive illumination causes an exceedingly great activity in decomposing carbonic acid, and probably oxygen cannot be respired sufficiently rapidly; hence there may be a reverse action, or an oxidation of formic aldehyde to formic acid.

The leading characteristics of unaltered leaf-green are those of blue chlorophyll, namely, an intense absorption in the red, stronger even than in the violet or ultra-violet.

[*From the Photographic News.*]

THE DIAZOTYPE PROCESS.

THE latest news about the diazotype process, as made known last week at a meeting of the London and Provincial Photographic Association, by Messrs. Green and Bevan, who in turn addressed the meeting, is that by means of facilities given to them by Captain Abney in his laboratory, it has been found that the maximum intensity of the action of the spectrum upon diazotized primuline nearly corresponds with the blue lithium line. Nevertheless, the action is strong in the yellow, and this permits the printing by light to a great depth in fabrics; on one occasion they had printed an image by one exposure through six superimposed pieces of sensitized cotton cloth; of course the images decreased in intensity and quality in the lower layers. The fact that the printed image does not interfere much with the passage of light to the sensitive substance below, they consider to be a valuable feature of this new mode of printing. They have not yet succeeded in getting a white background, but hope to do so hereafter; they have, however, discovered a means of changing the pale primrose color of the background to pale green, and this, they think, may be of use for certain artistic purposes. When they want to "undevelop" a developed image, so that, by means of another solution, it may be brought out a second time, but of a different color, they soak the print in a hot solution of hydrosulphite of soda, made by pouring a hot solution of bisulphite of soda upon zinc filings, and then giving a good shak-

ing to the containing vessel. At the meeting they demonstrated the effects of over-exposure by showing that the brilliant displays of color obtained when the exposure has been right are almost entirely absent when the action of light has continued too long.

[*From the British Journal of Photography.*]

COPYING BOOK ILLUSTRATIONS AND SIMILAR OBJECTS BY MEANS OF ARTIFICIAL LIGHT.

BY J. N. ARMSTRONG.

I DON'T know why it should be so, but with me it always happens that I receive most of this class of work to do right in the dead of winter, when but little daylight exists, and as it frequently happens that such commissions are always required in a hurry, recourse has to be made to some means of accomplishing the work by artificial light.

Quite recently a very large amount of this work has passed through my hands in the way of making lantern slides from book illustrations, pen-and-ink sketches and photographs for lecture sets—an amount, I may say, that it would have been quite impossible to have overcome with daylight in the short time allowed to accomplish the work.

Last winter, when making some experiments in another direction, I hit upon an excellent and most simple plan of doing this work both by day and night. The plan is so simple that any one having a supply of house gas at command, or in its absence a couple or so of good paraffine lamps will be found a most effectual substitute. To those gentlemen amateurs who are engaged with business care all day long, and who therefore take an exceptional amount of pleasure in lighting up a cigar and having a slip into their hobby on their retirement to their homes at night, the plan which I am about to describe offers considerable attractions, for perfect negatives can with the utmost certainty be made from cartoons, photographs, book illustrations or other similar objects; and once possessed of those negatives, then follows the further attraction of printing lantern slides from them, so that, in fact, as a hobby, photography stands only in an eminently satisfactory manner all the year round.

I am quite aware that for some purposes the employment of collodion is almost a *sine quâ non* in the work I am describing, and whenever possible I invariably use it in my working in preference to gelatino-bromide. But most excellent results can be obtained with gelatine, once a worker enters fully into the importance of the necessity of working on a certain line that yields him negatives which are strong in contrast, and which will permit of being printed so as to yield dense blacks before the high lights get veiled over or degraded. No doubt such negatives are more easily produced by means of collodion; but where nowadays among the vast army of those who practice photography as a hobby can we find those who know anything about collodion work? This being so need not, however, deter such from undertaking the work by means of bromide dry plates.

There is no great difficulty about it if gone about properly. To enable a worker to set about copying such objects one of the first necessities is a good copying-board. This is easily procured from any joiner, or a clever worker can, with a little trouble, make one for himself. Mine consists of a long board five feet by twelve inches by three inches deep, at one end of which is hinged two legs; this permits the board being elevated at one end when required, and is most useful when working in daylight, for it enables the copying-box, or whatever else is being copied, if transparent, being so elevated as to work into the sky. For night work this is not needed, although when any one is setting about making one he had better add the hinged legs, for sooner or later he will find them useful. The great advantage of this copying-board is that it enables the camera to be adjusted with much ease and certainty exactly

square on to the object being copied, for by means of lines ruled at various true distances across its surface it permits of the camera being at once registered exactly parallel to the frame, or whatever device be adopted for carrying the picture that is about to be photographed. Along this board the camera slides quite nicely, and in my experience it is not necessary to bind the camera in any way to the board by means of screws; it is quite easily held firmly in position when drawing the slide by merely pressing one hand on the front of the camera. I know of no better support to carry a copying-board for night work than a good kitchen table.

The next point which a beginner might feel some little difficulty in is the employment of a suitable means for holding the cartoon, photograph or whatever else is being copied, in position. When the object to be copied is simply a photograph, or some other picture mounted or unmounted, and not bound up in book form, there is no means so simple or easy as the placing of same in an ordinary printing frame which carries a sheet of clean glass free from scratches or flaws. With such the unmounted picture, whatever it may be, is held firmly in position against the glass by means of the ordinary back of the frame and springs.

(*To be Continued.*)

A COMPLETE PHOTOGRAPHIC LIBRARY.

We are glad to learn that efforts are now making to secure a complete Photographic Library, in which every book and periodical ever published in English, French, German, or any other language, will be accumulated and placed in the Library of Columbia College, which is open from nine o'clock in the morning till ten o'clock at night every day in the year, except Sundays and other legal holidays, and to which every responsible person may always have access.

We have long felt the need of such a library, having again and again been brought to a stand-still in our efforts to hunt up some photographic information by the want of "the next" book or journal.

We hope that all of our readers, who have in their possession old photographic books or periodicals, either sets or odd numbers, will contribute the same in order to make this library as complete as possible.

They may be sent to Professor C. F. Chandler, Columbia College, 41 East 49th street, New York, and their receipt will be acknowledged in the columns of the Bulletin.

As soon as the library is reasonably complete, it is the intention of the Bulletin to prepare a comprehensive bibliography of photography, so that our readers may know what books can be found in this library.

OUR ILLUSTRATION.

Our good friend C. F. Conly, of Boston, sent us a number of pictures some time ago, from which to select illustrations for prints; and the beautiful head with which we illustrate this issue of the Bulletin attracted our attention particularly, owing to its exceeding soft lighting, graceful posing and uncommon beauty as a piece of photographic art. Not that Mr. Conly ever sends out anything that is not worthy of the highest praise, but here the beauty of the subject and the skill of the artist seemed to be more than ordinarily exhibited. The original has been very finely reproduced by the Boston Heliotype Printing Company, and the work speaks for itself.

ANTHONY'S
Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.

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AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE regular meeting of the section was held on the evening of January 6th, Mr. HENRY J. NEWTON being in the chair. The Secretary acknowledged the receipt of several photographic periodicals, and announced that at the meeting on February 3d, Professor Elmendorf would lecture on his trip through Holland, showing lantern slides in illustration thereof.

Mr. Fisk sent for exhibition the new Rochester camera. This is fitted with the Gundlach Optical Company's lens, and is of the ordinary type of hand camera. Mr. F. J. Harrison exhibited a pocket magnesium magazine flash lamp. This is a tiny, neat, nickeled box, measuring only one by one by a half inch. It nevertheless contains sufficient material for fifteen consecutive flashes; a lighted fusee furnishes the necessary heat, while a bulb and tube furnish the supply of air.

Mr. J. WELLS CHAMPNEY—This is the best lamp I have yet seen. What is the price, and where can they be obtained?

The price is $2, and the lamps and sample pictures may be seen at Messrs. E. & H. T. Anthony & Co.'s.

Mr. Henry J. Newton then made a few remarks upon the lantern slides he had been recently making. Some were of the night-blooming cereus. The negatives of these were taken by flash light. Flash-light pictures are usually more or less flat, but by the suitable adjustment of two oil lamps he had been able to get good lights and shades. Other slides were of humming birds on the wing. These, as may well be imagined, are not easy subjects to catch, their motion being so rapid that they are frequently out of range before the snapping of the shutter. In making his slides he had found a quick developer gave as good results as a slow, weak one.

Mr. O. G. Mason then gave an outline of a scheme for the registration of photographs of places of interest and of public characters. The idea is to catalogue the same and keep a record of the locality of each. The Photographic Section of the Institute is the oldest photographic association in America, is a permanent body and a worthy home for such records. In this way it would become a headquarters from which much information could be obtained, and by the adoption of a complete system of cataloguing, any person would readily be able to find the whereabouts of any photographs of places of particular interest.

This suggestion was received with considerable applause, and Judge Shannon asked Mr. Mason to put it into the form of a regular motion.

Mr. Rutter believed that if the scheme was carried to a reasonable state of perfection it would give renown to the section, and this latter would be far more useful than it had yet been. A system of correspondence would be opened, and he predicted that in less than two years such would be the demand that five secretaries would be wanted. He believed that it would supply a long-felt want, and be an inestimable boon to newspapers and for illustrative work.

Mr. Mason then moved that a committee of three be appointed by the President to formulate the scheme. This was seconded and carried with enthusiasm. At the close of the meeting the President appointed as committee Messrs. Rutter, O. G. Mason and Cornelius Van Brunt.

A large number of slides were thrown on the screen, some from the collection of the Society of Amateur Photographers, from the hands of Mr. Hull, the Superintendent of the

Institute, and others from negatives made by Mr. Newton while on his summer vacation.

The Secretary was instructed to record a vote of thanks to the amateur society, and to the gentlemen who had so materially contributed to the enjoyment of the evening.

LYNN CAMERA CLUB.

THE Lynn Camera Club held its annual meeting, January 6th, at the club rooms, No. 42 Broad street. The growth of the Camera Club has been almost phenomenal during the year 1890. January 1, 1890, the total number of members was 39, and during the year 72 new members were admitted, making the membership January 1, 1891, 111. There were also 5 new members elected last evening, bringing the membership up to a total of 116. This club is therefore the seventh in size in the country, and considering the population of the city in which it is located the Lynn Camera Club is probably the largest and best equipped in the world. The founders of the club may well feel gratified at the successful outcome of their little gathering, January 3, 1888, in the small and uninviting room in the top of the old Bergengren Building, in Central square, where the Lynn Camera Club was organized. The report of the Treasurer showed that, notwithstanding the extraordinary expenses which the club has been compelled to meet during the year 1890, something over $1,400, which expenses have been necessarily incurred in the entire fitting up of its new quarters and in the purchase of apparatus of various kinds for the use of its members, the finances of the club were in a very satisfactory condition. The following persons were elected members of the club at this meeting: H. S. Townsend, Charles F. Pierce, Rev. A. A. Williams, A. J. Rosebrook and David Smith. The election of officers for 1891 resulted as follows:

President, W. H. DREW; *Vice-President*, J. N. SMITH; *Recording Secretary*, J. W. GIBBONEY; *Corresponding Secretary*, A. J. PURINTON; *Treasurer*, E. F. BACHELLER; *Librarian*, A. H. CARSLEY.

It is the intention of the club to give a series of interesting entertainments during the present season. January 20th there will be given at the club rooms an entertainment consisting of sleight of hand performance, select readings, music, etc., mention of which will appear in subsequent announcements. February 10th the club will have a competitive and general exhibition at the club rooms. This exhibition will consist of different kinds of photographic work done by the members. All competitive exhibits will be the product of amateur work solely. There will also be displayed photographic work which is wholly or in part the production of amateurs. Besides these entertainments the club will show from time to time the lantern slides of the Lantern Slide Interchange, to which it belongs, and other special slides of the highest merit, which are fortunately at its disposal. The large exhibition of photo-mechanical printing processes which was shown at the rooms of the Boston Camera Club some time ago will probably also be exhibited here. This exhibit, it is understood, is so exhaustive and complete that the club rooms will be inadequate to show them all. The President, Mr. Drew, gave a lengthy report of the meeting of the American Photographic Conference, held at the rooms of the Society of Amateur Photographers in New York City, to which he was sent as a delegate of the Lynn club. Mr. Drew reported that a large and enthusiastic meeting was held, that the permanent organization of the society was now an accomplished fact, and that it started its existence with a large and influential membership. A number of the Lynn club members have already sent in their applications for membership in the society. This organization will have an important influence upon the future growth of photographic progress, and we may confidently expect a still more rapid advance in this wonderfully interesting art than has marked its recent marvelous growth.

After the business of the meeting was concluded a collation was spread in the lower rooms, under charge of Caterer Van Vranken, of Salem, consisting of salads, ices, coffee, etc. All eyes were "focused" on this "view," and a number of "plates" were soon in condition to be "developed." It was but a short time before all the "plate-holders" were filled, and after a short social chat the cranks wended their various ways homeward, with no "fogginess," but filled with "halation."

This meeting brought out the largest attendance of members that the club ever had at a business meeting, the following being present:

W. T. Ash, Miss May L. Ash, G. M. Babb, N. N. Bacheller, E. F. Bacheller, B. D. Bartlett, Roy Bartlett, J. W. Bowley, F. E. Bramhall, S. F. Breed, Mathew Buchan, Miss J. F. Callahan, Miss M. A. Callahan, A. H. Carsley, Percy Chase, J. W. Coates, J. W. Darcy, W. H. Drew, J. C. Fox, W. L. French, J. W. Gibboney, W. B. Gifford, A. E. Gloyd, W. H.

Godfrey, A. E. Healey, J. H. Hollis, Guy C. Hovey, W. W. Griffin, A. N. Johnson, J. F. Ingalls, W. H. Messinger, G. W. Nash, W. A. Pevear, Mrs. W. A. Pevear, A. J. Purinton, C. W. Pooler, E. L. Proctor, W. H. Russell, E. B. Sprague, S. B. Stewart, Jr., S. C. Tozzer, E. Williams, A. J. Rosebrook, T. N. Tripp, W. H. Wheeler.

The following report of the Committee on Rooms, which was accepted, shows the growth of the club:

The present quarters of the club were dedicated on January 23, 1890, and the lower floor was leased in June, so that the club now occupies the entire building. The rooms have gradually been made more inviting and useful to members since the opening by the addition of enlarging and reducing camera and lens, exposing box, portrait camera and lenses, head rest, screens, shades, burnisher and the fine dissolving-view lantern, besides the necessary furniture.

There are still articles that will have to be added gradually, but, as will be seen by the Treasurer's report, the Committee has spent all that it was advisable to during the past year.

Extra lockers have been placed in the dark room, and a few more of the members can secure room there if they wish. The Committee wishes to call the attention of members to the fact that a great many of the electric lamps are left burning in the studio when they are at work in the dark room, thus causing an expense, and therefore waste of money that might be used for other purposes. From two to four lamps in front of the developing windows are all that are of any use, and the burning of lights on the other fixtures is a waste of the club's money. It is to be hoped there will be less waste this year.

Respectfully, COMMITTEE ON ROOMS.

AT a meeting of the Executive Committee of the Lynn Camera Club, Tuesday evening, January 13th, it was decided that some action must be taken to provide better accommodation for the members and friends who attend the exhibitions and entertainments; and it was proposed that the present dark room be removed and a new dark room as large as the present one, and a separate enlarging room, be put on the lower floor, the enlarging room to be fitted for either daylight or electric light enlarging and reducing.

As the change will necessitate an outlay of between $200 and $300, it was decided to give a first-class illustrated lecture and entertainment in a downtown hall, the proceeds to be used for the purpose above mentioned. It is thought, judging from the large attendance at the free entertainments of the club, that they have a sufficient number of friends to make a success of the undertaking, and thereby secure better accommodation for these friends at the future free entertainments to be given at the club house. The subject of the entertainment will be announced later, and the tickets will be for sale by members of the club at twenty-five cents each.

On Tuesday evening, January 27th, there will be another invoice of the New England Exchange slides, to be shown at the club rooms.

On Tuesday evening, February 3d, the regular monthly meeting of the club will take place, and by request the first of a series of demonstrations will be given; subject: "The A B C of Dry Plate Development." The President has consented to demonstrate this subject, and will have a number of different times of exposures on the same subject, and will show how to control the development of under, over and correctly timed plates.

At future meetings the other processes will be demonstrated, and any member wishing to see a demonstration of any particular branch will do well to send a note to that effect to the Committee on Entertainment, or place same in the mail box for that purpose at the club house.

On Tuesday evening, February 10th, the club will hold their second competitive exhibition at the club rooms and continue the rest of the week. The following rules will govern the exhibition:

All exhibits for competition must be entirely amateur work by exhibitor.

All prints must be framed, and where frames contain more than one print, each print must be lettered.

There must be nothing on frame or print to indicate ownership, but an invoice must accompany each frame giving title of picture, kind of print and name of exhibitor.

Both negative and positive must be the work of exhibitor.

Negatives must be such as have never been used in a competitive exhibition.

A diploma will be awarded for excellence in all classes of photographic work.

Judges will be three uninterested parties, appointed by the committee, to be announced later.

Framed prints, "for exhibition only," will be accepted, but frames must be so marked.

A diploma will be awarded for the best set of three lantern slides. All frames must be in the hands of the committee on or before February 7th.

On Tuesday, February 17th, the club will hold the entertainment spoken of above, thus making an entertainment already arranged for to occupy the evenings of five consecutive Tuesdays. The Entertainment Committee are to be congratulated.

It is desired to make the coming exhibition of the club the most successful of any so far held, and every member is urged to contribute at least one print for competition.

POSTAL PHOTOGRAPHIC CLUB.

The December "Album," now in circulation, is one of the very best issued since reorganization of club two years ago.

Among the seventy-six pictures contributed are Mr. Le Breton's and Mrs. Clarkson's series, illustrating the Christmas season. The latter's platinotype, little children hanging up their stockings over an old-fashioned fireplace, will undoubtedly win the first prize. Mr. Prentiss exhibits a magnificent surf study, "Off Block Island," Mr. Pulsford, two difficult cloud effects, and Mr. Stanton, on joining the club, excellent silver prints of "Honolulu Ferns" and two well-posed studio figures.

AGASSIZ ASSOCIATION—PHOTOGRAPHIC SECTION.

Manhattan Chapter.

The annual meeting of the section was held January 9th, at 141 East 40th street. The annual reports of the Secretary and Treasurer were read and approved, followed by the election of officers, which resulted as follows :

President, Edward B. Miller; *Vice-President*, Frederic Schneider; *Recording Secretary*, C. F. Groth; *Corresponding Secretary*, W. T. Demarest; *Treasurer*, W. S. Miller; *Curator*, Rudolph Moeller; *Librarian*, D. Hayek.

Members of the Board of Trustees : Anton Nehrbas, Horace T. Rowley, William Schneider, Adolph Stahl and O. H. Lee.

The Secretary's report showed many changes during the past year, chief among which was the removal of the dark room to new quarters at 141 East 40th street, where much better facilities for work are offered than at the old rooms.

The chapter is continually adding new and improved photographic apparatus for the use of the members, as fast as any need is apparent, and stands ready to still further enlarge the dark room should any marked increase in the number of members render it advisable.

Although, in view of the privileges offered by the section, the members' dues are extremely low, it was decided not to increase them, and they remain at three dollars per annum, with an initiation fee of one dollar.

The section will hold a Photographic Exhibition the latter part of February, at which only the work of members will be shown. From the amount of wall space already engaged, a large and interesting exhibit is confidently expected. Particulars as to exact time and place will be published shortly.

W. T. Demarest,
Secretary.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

This society held its regular monthly meeting on Tuesday evening, January 13th, *President* Stebbins in the chair.

Secretary Burton having read the minutes of the last meeting, Mr. A. Peebles Smith demonstrated a method for obtaining any number of images up to eighteen upon one and the same plate. The idea, he said, was by no means new. Several years back examples had formed the illustrations of Anthony's Bulletin, and others had appeared in England. To prevent the appearance of one object showing through the other, and to do away with apparent overlap, he used a small slit of yellow medium in the diaphragm of the lens of width sufficient to cover the place of overlap. The first exposure is short, the second of longer duration and without the color screen. A sliding carrier on a box in front of the lens has a slit corresponding to the fraction of the plate to be exposed. The shutter is held in front of the lens by rods, and thus acts as a vignetter.

A paper on Orthochromatic Photography had been promised for the evening, but, owing to the indisposition of the author, it had to be postponed. President Stebbins then read a paper on "Novel Printing Methods." The methods touched upon included printing with the salts of iron, uranium, chromium and platinum. The formation of an image with each of these salts depends upon their reduction by light in the presence of organic matter, and of the rendering visible of this reduction by means

of suitable chemicals. The ferro-prussiate process, uranium printing and platinum printing were described, and the chemical changes which take place in each case demonstrated. Paper prepared with uranium nitrate and silver nitrate prints out quite visibly, and only requires fixation in hypo. Directions as to the obtaining of brown and black pictures from blue prints were also given. To obtain brown tones, lay the blue print in a dilute solution of caustic soda. A brown image consisting of ferric hydrate results. If this is washed and placed in tannic acid a black picture is obtained.

Mr. F. C. Beach exhibited a novel plate rocker. The dish containing the plate is placed on a metal framework which communicated by means of a connecting rod and crank with clockwork actuated by a powerful spring. A steady rocking motion can by such a device be given to a tray for some two hours if necessary.

Probably the most interesting exhibit, and perhaps the most interesting, photographically speaking, in New York, was that loaned for the occasion by a friend of the society. Two of the color photographs of Herr Veresz, of Austria, were shown and passed round. Red, orange and blue were distinctly visible. These photographs had been exposed for some hours to sunlight without any visible detriment.

NEW YORK CAMERA CLUB.

THE second of a series of informal meetings was held on Monday, January 12th, the matter under discussion being "The Lens." This subject was ably handled by Dr. Devlin, who, with the aid of diagrams, traced the whole subject of image formation from the pinhole camera to the latest work of Dallmeyer. Quite a pleasant feature of the evening was the number of ladies present, nearly one-half the audience being of the fair sex.

President DAVID WILLIAMS having introduced Dr. Devlin, the latter said his subject appropriately followed that of the last meeting—the gelatine plate.

Dr. Devlin dismissed the pinhole camera by remarking that the image on the screen is a reproduction of the opening. If we reduce this opening we obtain greater sharpness, but also cut down the light. We also get diffraction rays, that is, a series of prismatic bands, which would confuse the image. There is therefore a limit to the reduction of the size of the aperture, a limit consequently to the production of sharpness, and an increase of this latter factor diminishes the amount of entering light. We must for these and other reasons discard the pinhole camera as an instrument for obtaining good images. We cannot have more than the one pinhole, for we should get an image of each opening, the one confusing the other.

In order to get more light and equal sharpness we must have an instrument which will deflect the rays so that all will meet at one point. Thanks to the peculiarities of the prism this is attainable. In entering a prism a ray of light is bent towards the normal, and in leaving it away from the normal. We could thus have a series of openings, and opposite each could place a prism. This is obviously inconvenient, if not impossible. But if we construct a spherical surface we can get a continuous surface of a transparent medium which will serve a similar purpose. Rays entering at the middle will not be deflected. Adjoining rays come to a focus at some point along the axis. Rays entering near the edge of the lens instead of meeting at the same point reach the axis at points nearer the lens. A point of light would thus be spread out to form a line. These points are just as much foci as those from rays near the center, and we get what is virtually a trumpet-shaped surface of light instead of a point. This is what is known as spherical aberration. No photographic lens has much spherical aberration, the outside rays being cut off by means of a diaphragm. But there is a still more important aberration.

This is what is called astigmatism. Practically, it is the impossibility to get vertical and horizontal lines into focus at the same time. This was shown to depend on a question of symmetry, by the use of a small lamp and double convex lens. For any set of rays off the axis, there are two distinct sets of curves to encounter. The rays are hereby divided into two sets, one converging more rapidly than the other. Astigmatism produces effect on the marginal definition.

Still one other aberration—chromatic aberration. Having a lens receiving white light, this latter is split up more or less into its component parts, and the violet and blue rays come to a focus before the red and yellow. If we had only one kind of glass, this difficulty could not be got rid of, but by combining flint and crown glass, using a double concave and a double convex lens in conjunction, the most widely diverged chemical rays are neutralized or brought back by the action of the concave

lens where the chemical rays are the most convergent.

Taking the single lens, we find it subject to spherical aberration and to astigmatism. We may place a stop close to the lens so as to utilize only the central portion, but this would be at the expense of the flatness of the field. Placing the diaphragm further away, we shall improve the image, because it will cut off most of the oblique rays which have not crossed the axis before entering the lens. The further away we move the stop the more we flatten the field, but the more we contract the angle of view. We thus get rid of most of the astigmatism, but at the cost of the working angle and of the amount of entering light.

In a double lens astigmatism is got rid of in a different way. We have seen it to be due to a lack of symmetry. If we could use a sphere and limit number of rays from one point to a small arc, we should get rid of aberration. But a sphere cannot be used for distant objects. We have, though, regained our symmetry by compelling the rays to cross the axis. To make a double lens, we separate the two halves of the sphere and preserve its qualities to a large degree. In stopping down a double lens, we ensure that only rays that have crossed the axis shall reach the posterior combination.

In a wide-angle lens the combinations are much nearer together than in a rapid rectilinear; the stop is smaller, and usually the lens is not symmetrical.

A single lens with usual stop has its astigmatism fairly well corrected, has a fairly flat field, and is of moderate angle. The defect is distortion, which is not due to curvature of field, but is a side phenomenon of astigmatism. In a double lens we can get flatness of field by separating the combinations, but we lose on marginal definition and contract the angle.

For cleaning lenses, Dr. Devlin recommended Japanese filter or tissue paper. A small bubble in a lens is of little importance, nor is a slight striction or cloudiness, except that it may indicate a possibility that the lens is not homogeneous.

The next informal meeting will listen to a discussion of "Development," by John Howard Wainright, Ph.B.

COLUMBUS CAMERA CLUB.

THIS active organization, not content with its regular meetings, held a special one on the evening of the 12th, to which all photographers, professional and amateur, of the city were invited. To accommodate the assembly taxed the capacity of the meeting-room.

The special object of the meeting was a very able lecture, on the optical lantern, delivered by one of the members, Mr. G. L. Graham. He very fully illustrated all points considered in the lecture by apparatus. The lecturer traced the history of this valuable branch of photography through the succeeding stages of its development aiming at the modern lantern. He discussed the merits and objections of the different sources of light, oil, electric, oxyhydrogen and oxygen and ether saturation, calling especial attention to the different forms of the latter, the blow-through jet, mixing jet and when the gases are mixed in a chamber before they come to the point of ignition. All necessary precautions were alluded to in handling the gases.

Next the condensers were considered, their position, size and arrangement and function.

After considering the condensers the lecturer took up the objective, and carefully explained its use, size and form to secure the best results for any particular kind of work.

Following the consideration of each essential part of the lantern, the accessories came in for their share, and he closed his lecture by referring to the various applications of the lantern, illustrating the fact that its value in educational work was recognized by the New York Legislature in appropriating $18,000 in one year with which to purchase lanterns to be used in the educational institutions of the State.

The lecture was followed by a discussion of the subject, which ended an instructive and interesting meeting, and proved that Mr. Graham's reputation as a lantern expert was well deserved.

THE regular monthly meeting of this organization was held on the evening of the 15th. The House Committee was authorized to purchase an 8 x 10 portrait camera complete, and no doubt this addition to the club's apparatus will increase the interest among the members in this branch of the work, and besides be beneficial (financially) to the dealers in plates and developing materials.

This committee was also authorized to purchase additional conveniences for the dark room, and lockers for new members, as several have been admitted lately.

The remainder of the evening was devoted to an informal discussion of several changes in the club's constitution, recommended by the president.

The meeting closed by deciding to hold a special meeting two weeks hence to further consider the changes. J. N. Bradford.

PACIFIC COAST AMATEUR PHOTOGRAPHIC ASSOCIATION.

The association held its regular monthly meeting January 8th, in its new rooms in the Flood Building. Some eighty members were present and their friends. The walls of the room were covered with a collection of carbon prints of amateur photographers, which will be submitted for prize photographic competition.

Major Heuer gave a demonstration of enlarging on bromide paper by artificial light and a very simple arrangement of an ordinary camera. Various slides were shown on the screen. They included views of prominent places in China, Pompeii, Yellowstone Park, Michigan and many other parts of the world. The audience were well entertained for several hours, and gained much useful information regarding the study of photography.

BROOKLYN INSTITUTE—PHOTOGRAPHIC DEPARTMENT.

The monthly meeting of the department was held in the music room of the Young Men's Christian Association, 502 Fulton street, January 13th, a good audience being present. *President* Alexander Black presided. *Secretary* Gould W. Hart attended to the record. During the business session the following men were admitted to membership of the department: Frank A. Butler, George C. Brainerd, J. H. De Ehnee, Arthur W. Harrison, Frederick L. Pitman and Charles P. Pitman, M.D. Dr. Lewis W. Meeker, Chairman of the Committee on Stereopticon Views of Brooklyn, which are being prepared for the International Amateur Photographic Interchange, reported progress at a very low ebb, and that contributions are coming in very slowly. Dr. Meeker, who has been doing the greater part of the work himself so far, mildly hinted that he was getting somewhat weary of the struggle, and asked for immediate and voluminous assistance in the way of contributions. President Black announced that Professor Ferdinand T. Lee Boyle, who was to have given a lecture on "The Principles of Art, as Applied to Photography," last evening, was ill and unable to leave his home. President Black, however, took his place admirably, by giving a short discourse on the importance of the study of the composition of light, with regard to photography, and illustrated his remarks by blackboard illustration and a description of the spectroscope. Following this came an exhibition of a large number of excellent stereopticon views, which occupied the remainder of the evening.

BROOKLYN ACADEMY OF PHOTOGRAPHY.

Meeting held Jan. 15th, in Hoagland Laboratory.

The evening was devoted to scenes on the Island of Jamaica, and aside from the pleasure afforded by the slides they were accompanied by an instructive and entertaining talk upon the places of note and customs of the people of that sunny land far to the south. The pictures and talk were the results of a few days' sojourn on the island by Mr. Gonzalo Poey, one of the workers of the academy, and the title given the display was "A Few Days in Xaymaca."

President La Manna, in introducing the speaker, Mr. Poey, laughingly said that he would leave the pronunciation of the name to the lecturer, as it was entirely beyond him. Mr. Poey, in coming to the rescue, said that Xaymaca was the name given to the Island of Jamaica by the early Spanish navigators, and was a corruption of two Indian words—chab and makia—meaning an abundance of wood and water. The speaker, after a short talk upon the position and formation of the land, then proceeded to explain incidents of the trip from the harbor of New York. Some fine pictures of the steamer and pilot boat as well as views of the harbor on the way down the bay brought the spectators out to the broad Atlantic, where the long journey down was enlivened by glimpses of life on shipboard. The first land sighted in the West Indies was San Salvador, and then the harbor at Kingston, Jamaica, was shown. All the slides were prepared from views taken by a hand camera, and many of them were extremely good.

The ramble about quaint old Kingston was a picturesque one. The town of some 40,000 inhabitants is the capital of the island, and, situated upon the bay of Port Royal, afforded an endless field for the camera man. The audience were given a peep at the market-house, with the bartering natives who had come for miles with but a few pennies' worth of stock in trade; then a glance down King street showed where much of the business of the

town was done; and then a sudden jump displayed a fine statue of General Metcalf, the only governor with whom the people had ever managed to get along. A fine old Jewish synagogue was shown to be crumbling into decay; and then the visitors were taken to the residence portion of the town, where the villas of the rich men stood in groves of grand and mighty tropic plants and trees.

The speaker said that there was little use for police in the town, but nevertheless the native guardians of the peace were finely uniformed, as were the mail-carriers. A vast jump was then made to the Constant Spring Hotel, over which presides Colonel Merrett, formerly of the Union Square Hotel, New York. Some fine mountain scenes brought the travelers up to where the soldiers are quartered; and then a run was made to Bath, where the natural mineral springs, both hot and cold within a short radius, afford so much relief to sufferers from rheumatism. Then came views of Port Antonio, Port Maria, Lucca, Savannah la Mar and scenes about the sugar plantations, which still bear an air of the old-time industry when all the island was devoted to the cultivating of the sugar cane. All that is past now, and banana-growing has taken its place.

In connection with the different points of interest along the route, the audience caught many homely glimpses of the life and queer things that go to make up the nationality of the people. Some of the water scenes and landscape views were extremely beautiful; and the audience were but sorry when the farewells were said upon the wharf at Kingston, and the good ship pointed her nose homeward and at last landed them all at the Hoagland laboratory.

Bibliography.

Die Photographie mit Bromsilber-gelatine, von Ludwig David and Charles Scolik. Halle a. S.: Wilhelm Knapp.

We have before us the second volume of this handsome work on photographic processes depending on the use of the gelatine dry plate. It gives very complete directions for the preparation of orthochromatic (or, to use the author's term, orthoskiagraphic) plates, and the results obtained by their use. The illustrations, both color plates and monochromes showing the translation of the colors into correct values of black and white, are very finely produced and full of interest. This part of the subject is treated in a thoroughly scientific manner. The authors also go into great detail in regard to the various failures resulting from orthochromatic work, and the remedies for the same. The concluding pages of the volume contain a large number of receipts of all kinds for photographic work. The work is thoroughly practical and well worthy of study by the progressive photographer.

Die Photographische Retouche, von Wilh. Kopske. Berlin: Robert Oppenheim.

This is the first part of a neat-like volume upon retouching, from the pen of the founder of the First Berlin Retouching School. It discusses the art from a thoroughly practical and artistic standpoint, embracing the retouching of negatives, positives on glass, albumen prints, plain salted prints and crayon and colored pictures. The directions for the use of materials are very explicit, and must prove extremely useful to those studying the art. With the assistance of a good teacher, and an artistic spirit born in the pupil, the book will prove a useful companion to the latter.

Traité de Photographie Appliqué au Dessin Industriel. Par M. Masselin. Paris: Gauthier-Villars.

This is a little French volume of about 130 pages, designed for schools, amateurs, engineers and architects wishing to use photographic processes in the development of designs for industrial decoration. The fact that this is the second edition of the work speaks well for its usefulness. The greater part of the book is a description of wet-plate methods and their management. A short chapter at the end gives an account of the use of dry plates, and also the manipulation of the blue-print process. The directions are short, well stated, and the whole volume has a thoroughly practical tone.

Traité Practique de Photogravure sur Verre. Par A. M. Villon. Paris: Gauthier-Villars.

A small volume of about twenty pages, giving directions for practicing photogravure upon glass. This is practically a description of the methods of using photographic processes as assistants in etching glass by chemical, mechanical and other means, for producing artistic designs. It also treats of the various methods of transfer and the production of colored designs upon glass by the joint aid of photography and etching.

The Optical Lantern. By Andrew Pringle. New York: Scovill & Adams Co.

This is one of the Scovill Photographic Series, and contains about 100 pages of very useful matter to all interested in lanterns and lantern work. It embraces all the latest developments, and is written by a master-hand on the subject.

Photographic Mosaics, 1891. New York: Edward L. Wilson.

Yielding to the pressure of the times, Dr. Wilson sends forth his new volume of Mosaics in handsome style. As usual, it is stamped with his own individuality and the experience of twenty-seven years. The band of helpers he has called to his assistance form a galaxy of writers of sterling worth, and every page of the record of their work is valuable. He has also added a large number of photo-mechanical prints as illustrations to the volume. We cannot copy any one article as a specimen, but recommend Mosaics for 1891 to every one interested in photography.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the Bulletin. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—D. H. H. writes: In the formula given with Anthony's Ready Sensitized Albumen Paper instructions are given to soak the prints just as they come from the printing frame, in

Water....................6 ounces.
Citrate of soda..........20 grains.

Would there be any advantage in washing the prints first in water before putting into the citrate of soda solution; or, would there be a real or a theoretical disadvantage in so doing?

A.—The use of citrate of soda is for the purpose of washing out the excess of silver nitrate in the paper before proceeding to tone the prints. If ordinary water is used the chlorides sometimes found in it would cover the prints with a milky deposit of silver chloride and retard the toning. If pure water is used citrate of soda is not necessary; but with water containing chlorides, silver chloride cannot be precipitated as it is soluble in sodium citrate.

Q.—A. J. R. writes: I have had considerable trouble this winter with the albumen paper, sometimes a whole sheet, and again half of the sheet, will print mostly like the enclosed picture, and I cannot in any way stop it. The defect is in the paper.

A.—The trouble is due to too cold solutions, as silver bath, or a wide difference of temperature in the toning and fixing baths. The latter should not be less than 70 degrees Fahr. when the toned print is put into it.

Q.—J. C. F. P. writes: I have been having trouble with my printing. The paper specks, while printing—measels. It has bothered me ever since the weather got cold. I have searched in vain for the trouble, and am completely at a loss to know what to do. I thought first it was caused from a negative being inefficiently washed, but after the disease appearing just the same on a negative that printed all right last summer, I know that was not the cause. I next thought it might be caused from condensation of moisture, from taking the paper and negative from the warm room out into the cold, as I print out-doors. I have dried the paper thoroughly before fuming, and fumed thirty to forty minutes with strong ammonia. The paper has always been rather dry before silvering. My silver bath is plain silver nitrate and water with a pinch of sodium carbonate occasionally, sunned and filtered, and shows 50 degrees on the hydrometer. I have also thought the paper might be too dry, and tried holding it over the vapor from a pan of hot water, which seemed to help it a little but not to cure. I will inclose you one of the untoned prints, hoping it will enable you to diagnose the case correctly and to my great relief. The loss of paper is considerable, but nothing compared with the loss of time and failure to get out a batch of prints. Also, can you tell me how to use a pair of wide-angle lenses, No. 1 Darlot, in a 5 x 8 Novel camera. The distance from the front to the ground glass is greater than the focus of the lenses.

A.—The trouble that you complain of is one that generally occurs in cold weather. Your silvering room should be warm and the bath also, say 70 degrees. It will not do to print out of doors in extremely cold weather. See that your paper is dry before fuming. To use your wide-angle lenses you will have to make a cone to allow the lense board to set inside the front line of the camera. A neat cabinet-maker would be able to fix it for you. Mount the lenses 3½ inches apart from center to center and put in a stereoscopic division.

Q.—J. A. W. writes: 1. I am trying to make a glass mirror for the copying process, and wish you would please give me "Liebig's Silvering Method" for silvering glass mirrors, mentioned in your BULLETIN of October 10, 1885, page 599, but details not mentioned. Please give the formula, proportions and chemicals in full. 2. Please also state how the opticians grind and polish their photographic lenses; what materials they use in polishing them with?

A.—We do not now know where to find Liebig's original method, but the following used for telescope mirrors works well. Make three solutions:

No. 1.

Silver nitrate...........	480 grains.
Water.................	10 ounces.

No. 2.

Caustic potash (pure)...	480 grains.
Water.................	10 ounces.

No. 3.

Glucose	240 grains.
Water	10 ounces.

To the silver solution add ammonia till precipitate first formed is *just* redissolved. Then add the potash solution, and again dissolve the precipitate which forms in more ammonia, *only just enough.* Now, add another silver solution, five grains to the ounce, until a faint milkiness appears, which remains after thoroughly shaking. Allow the mixture to settle clear. Add the glucose solution just before using, pouring the final mixture upon the thoroughly clean glass. After fifteen minutes the surface is silvered and should be carefully washed, drained, dried and finally polished. The question about lenses needs an answer too long for these columns.

Views Caught with the Drop Shutter.

MR. JOHN REID, the well-known photographer of Paterson, N. J., has always been noted for his fine photographs of machinery; but he has recently accomplished something that casts into the shade all his previous achievements. This is a photograph of Washington Bridge over the Harlem River, covering a print 14 x 30 inches, which, for detail and fine lighting, is a gem of photographic skill. It should be seen.

PHOTOGRAPHER BENJAMIN J. FALK has brought a suit in the United States Circuit Court against Schilling, Stallwerck & Co. to restrain the latter firm from selling and making copies of a picture of Lillian Russell which he secured in 1889 and had copyrighted. An injunction is asked for, and an accounting of profits made by the infringement.—*New York Times.*

THE HARRIS PHOTOGRAPHIC SUPPLY CO., of Detroit, send us their neat little list with "The Compliments of the Season." It is dainty, well printed and worthy of these enterprising merchants.

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EVENING POST JOB PRINT, N. Y.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. FEBRUARY 14, 1891. No. 3.

THE QUESTION OF EXPOSURE.

THERE is nothing so important in photography as the correct time of exposure for the sensitive plate, and there is nothing that is so little studied. Ordinary gelatine bromide of silver plates of the slowest kinds are reasonably easy to work; but even in the case of these there are a great many mistakes made through a want of attention to the simple question of exposure. The varying conditions of sunlight during the day, and also during the year, appear to be almost entirely forgotten in the statements of those who give accounts of the manner of obtaining pictures of a certain character. We often have prints sent to us for criticism with no statement as to how good the light was, or the time of day when the exposure was made. The majority of these pictures have one great fault—over-exposure. Yet the principles that govern this matter are easily understood by the tyro, if he will only stop long enough to allow them to become impressed on his mind; in other words, give his brain a sufficiently long exposure to their influence that they may develop in his practice.

We are perfectly aware that a certain amount of over-exposure may be corrected in the development, but the trouble is that in the majority of cases that come before us there is no attention paid to this part of the question. A negative can be taken of the same landscape in three seconds, and also in ten, and by careful development almost duplicate results may be obtained. This can be accomplished when the exposure is known within moderate limits, and the development of the longer exposure is made with a weak developer, and the work is prolonged. A developer that is weak in alkali and contains plenty of restrainer is the best to use for over-timed plates.

But with all the care possible we do not prefer pictures that have been much over-exposed. They almost always have some flat spots in them that take away from the general beauty of the whole, and the prints look patchy.

There is no more useful kind of knowledge that the photographer can acquire than a knowledge of the light of the day in its various changes from morn till eve. The time of year must also be taken into consideration while making calculations about the time of day.

Dr. Eder has arranged photographic subjects in relation to their action on the photographic plate as follows :

Sky and sea	1
Distant bird's-eye view	2
Panoramic view—nearer	4
Bright foreground	8
Dark foreground	16
Foliage in shadow	16
Groups and live objects	16
Portraits and groups under cover	32
Thick foliage badly lighted	48

The above classification means that if you give one second exposure to a sea view in a certain kind of lighting you will have to give twice the amount of exposure to a distant view with the same lighting. Looking at the question from another point of view, the time of day, we have the table of Dr. Scott to help us. Here the month of the year is an important factor in the calculations.

Dr. Scott's table is as follows :

Hour.		June.	May. July.	April. August.	March. September.	October. February.	January. November.	December.
12		1	1	1¼	1½	2	3½	4
11	1	1	1	1¼	1½	2½	4	5
10	2	1	1	1¼	1¾	3	5	6
9	3	1	1¼	1½	2	4	12	16
8	4	1½	1½	2	3	10		
7	5	2	2½	3	6			
6	6	2½	3	6				
5	7	5	6					
4	8	12						

The above table is used by a number of workers, and is believed to be reliable. It is a simple way of arranging time of exposure according to the power of the light at various times of the day and year. If a plate of a certain brand requires one second exposure, with a given stop, at noon in June, it will require four seconds in December, with the same plates and same stop.

The quality of the light during the day is also influenced by the clearness of the sun. If the sun is bright and the right exposure is found to be one second, in diffused sunlight this time becomes two seconds, and in dull light it should be extended to three, while if the light is very dull five seconds are necessary.

Remembering the last statement, each worker may figure out a table to suit the various stops of his lens and always carry it with him. After a little use he will find that his table has taken a place in memory and that he no longer refers to it, having by repeated use learned all its factors.

In every set of calculations the brand of plates used are, of course, an important factor, and we cannot too strongly impress the beginner with the importance of the fact that he should obtain a reliable brand of plates, and having learned to use them, make no change until he is perfectly satisfied that the plates are at fault and not himself. As a rule it will be found that the worker is at fault, and not the plates.

As the spring approaches and outdoor photography becomes again enjoyable, the first work to be done by those who have trouble with exposure, is to

study the plates that they are going to use this summer. Taking a good bright day and a medium stop, expose a plate in the camera upon a distant view, drawing the slide from the plate-holder in sections to give the plate several different times of exposure in order to find the correct one for that kind of plate and on that date. From the results so obtained, the values for other stops can be calculated in regard to their size, applying the tables given on opposite page.

The weeks will soon speed by, and for pretty effects the spring-time landscape is the best of the year. We would therefore urge our readers to be stirring themselves to get their apparatus in order.

EDITORIAL NOTES.

The annual report of the Harvard Observatory, under the charge of Prof. Pickering, shows a most interesting and laborious year's work. The work carried on under the Henry Draper fund has been particularly exhaustive, and observations at the Harvard Observatory and in Peru have resulted in obtaining a map of almost the entire heavens from 20 degrees south to the South Pole, stars of the eighth magnitude even being represented. Mrs. Draper has recently provided the observatory with a magnificent photographic telescope of eight-inch aperture, similar to the one in use at the Peruvian station, and a large part of the heavens has been covered with it already. There is no doubt that astronomical photography is increasing in interest, and the results obtained in this direction are more important year by year.

An important and interesting discovery has recently been announced by M. Cailletet, by which glass or porcelain may be soldered to metals. His method is to first coat the glass with a thin covering of platinum or silver, by mixing neutral chloride of platinum and oil of camomile and applying by means of a brush of spun glass upon the surface to be cemented, afterwards evaporating till the white vaporous emanations have ceased to appear. The glass is then heated to a dull red tone, when the platinum takes the form of a metallic film, on which, after cooling, it is a simple matter to deposit a coating of copper by electricity, upon which another coating of glass or of any other metal may be readily soldered.

We note with regret the death of one of our old-time friends in the profession, and a contributor to the "Annual" in former years, Mr. William Adcock, of Melton Mowbray, England, who passed away at the age of sixty-nine years. Mr. Adcock was a most courteous and genial gentleman, and an earnest and hard-working member of the craft; his death will leave a void which it will be hard to fill.

A very interesting and instructive demonstration of the method of making lantern slides by flash-light was made before the Yonkers Photographic Club, on the 17th of last month, by Mr. Robert M. Reevs, who illustrated his methods by practical experiments. It may be of interest to know that Mr. Reevs has contributed an article on this subject to the "International Annual," which will be illustrated with diagrams, and which is in effect an epitome of this demonstration.

It seems by reference to works published as long ago as 1849, that malleable glass, so called, was known, and window panes, vases, bottles, etc., impervious

to water, unbreakable but transparent, were then made by rendering *papier maché* transparent by chemical agents. The formula for this change was first published in that year by Prof. Schoenbein, the inventor of gun cotton.

A METHOD much in use by those who understandingly make lantern slides from line engravings, is to place over the engraving to be copied, a piece of fine ground glass with the ground side out; this is then carefully wiped with a cloth charged with oil, taking care to leave more over such parts of the picture as require longer exposure than other parts; the result is an almost entire absence of lines, and the effect is more that of a fine, soft crayon than an engraving.

WE understand that the St. Louis Camera Club purposes joining with the St. Louis Pastime Club, by which union it will combine both photographic and social elements which will be of vast help to each. An exhibition of lantern slides of Eastern cities is now under way, and everything points to a decided success for the club.

A MOST ingenious arrangement has lately been effected for photographing the internal tremors and noises of the earth. Signor Baratta, of Italy, has demonstrated that a subterranean microphone, connected with telephone diaphragm, will produce waves which may be reflected on a mirror, supported by means of a thin piece of aluminium wire. The mirror, rotating in a circle and connected with a camera which automatically exposes a plate at regular intervals, records the vibrations with perfect accuracy.

WE are in receipt of three photographs from J. E. Meddaugh, of Rushville, Neb., which give a most vivid conception of the nature of the country thereabouts and the appearance of traveling parties in that portion of the far West. One of these prints shows a majestic basaltic column apparently springing straight up from the earth to a height of 625 feet. It is called the Devil's Tower, and is a landmark of prominence in the Black Hill region. The picturesqueness of these prints is very considerable, and we hope to see more from the same country.

THE exhibition of the Hartford Camera Club, which opened on the 2d of this month, was most cordially entered into by its many members and friends, nearly five hundred pictures having been entered for exhibition. At the time of going to press we are unable to mention the prize pictures, but hope to do so in a later issue of the BULLETIN.

A NEW method of producing oxygen gas has been discovered by Mr. Kastner, which is based upon the fact that plumbate of lime, heated with an alkaline carbonate, decomposes, forming carbonate of lime and peroxide of lead. If the temperature is increased, the peroxide of lead transforms itself into protoxide of lead and oxygen gas, leaving in the retort an amalgamation of protoxide of lead and carbonate of lime, which, if brought up to the proper temperature in a current of air, is again transformed into plumbate of lime—by this it will be seen that if the proper degree of heat can be maintained the several reactions may be continued indefinitely and an unlimited supply of oxygen obtained at very little cost, if the materials do not become inert from continued heating.

There are before us two specimens of snow photography which are deserving of much praise. They are from the studio of Mr. Smith, of Cooperstown, N. Y., and show conclusively, not only that that portion of the State has its full quota of snow, but that it also has a resident photographer who knows how to do it justice. One in particular is especially fine inasmuch as it is soft in the extreme, and at the same time full of brilliancy and detail—from the highest lights to the deepest shadows.

A most valuable and interesting series of papers is in course of publication by the *Indian Journal of Photography*, written by Colonel Waterhouse, the Surveyor-General of India, and devoted to a description of the processes in use by the photographic and lithographic office of the Survey.

The Mystic Camera Club of Medford, at its annual meeting, elected the following officers : *President*, Joseph H. Wheeler ; *Vice-President*, A. H. Boardman ; *Treasurer*, J. F. Wade ; *Secretary*, Will C. Eddy.

We had opportunity a short time since to examine the magnificent collection of views made by Mr. H. W. Gridley, of this city, in the ancient city of Palmyra, on his recent Eastern trip. Mr. Gridley is the second photographer who has visited these ruins, and has reason to be proud of the results he brought with him. His plates he took to Cairo before developing, and after returning to London on his way home, was offered several hundred pounds for four of his negatives for publication, and was awarded a gold medal by the British Photographic Society. These prints need to be seen to be appreciated.

The preliminary meeting of the Executive Committee of the Photographers' Association of America was held in January at Buffalo, with a view to selecting a site and arranging the details of the coming convention. Over $1,000 is to be offered in prizes, and the field is so wide that all kinds of work will have a show.

The Case School Camera Club have elected for the ensuing year the following officers : *President*, Edward A. Phillips ; *Vice-President*, Arthur C. Spencer ; *Secretary and Treasurer*, Edward H. Williams ; *Corresponding Secretary*, Milton B. Punnett.

The Camera Club Photographic Conference of England for 1891 will be held at the Society of Arts in London, on Tuesday and Wednesday, April 7th and 8th, under the Presidency of Captain W. de W. Abney, C.B.; R.E.; D.C.L.; F.R.S., to which all photographers are cordially invited, and requested to take part in the discussions.

The Albany Camera Club are now fairly at home in their new quarters, which were formally opened on January 12th last. The occasion was one of pleasure and rejoicing to all members and friends of the club, which is now in an enviable position of prosperity and good prospects.

It is proposed to form a camera club in Salem, Oregon, where, though there are several enthusiastic amateurs, there has as yet been no formal organization. We wish the movers of this enterprise all the success they desire.

Herr Dobrzynski, of Lemberg, has, by means of a number of gelatine plates, some arranged parallel to and others at right angles to the direction of electro-magnetic waves, succeeded in obtaining photographic effects, showing distinctly a number of stripes of color alternately light and dark in the direction of the waves, which prove, in the opinion of Herr Dobrzynski that the electro-magnetic waves differ greatly in length, and that those of from 6 to 200 m. produce an effect on the photographic plates.

The management of the Columbian World's Fair at Chicago seem to be inclined to give to photography a good show, and are even now arranging for space and position for this art. It will be grouped with the Fine Arts, Plastic, Pictorial and Decorative, and will probably be awarded commodious space. Those intending to exhibit will do well to consider what room they will require even at this early date.

Those of our readers who are interested in the question of photography in colors, should read the remarks of Mr. F. E. Ives in our report of the Photographic Society of Philadelphia in this issue of the Bulletin, as well as the report of his lecture before the Franklin Institute, "Photography in the Colors of Nature."

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Illumination and Time of Exposure—Hartnack's Pantoscope—Chemical Mistakes in Photography—Photographic Researches regarding Flying Objects—Combination of Red Glass for the Dark Room.

It is an old rule that the times of exposure must be much longer as the light decreases; therefore at only one-half of the light the time of exposure should be doubled, at a quarter of the light it should be four times as long, at a twelfth part of the light the exposure should be twelve times as long, as at ordinary illumination. Tests have confirmed the correctness of this rule, at least so far as photographic practice is concerned. Dr. Michelke has recently made more exact experiments upon this point, and has determined the exact degree of coloration reached by a plate under a certain time of exposure.

He exposed for instance at one-quarter of the illumination so long, until he obtained the same coloration as with ordinary exposure at ordinary illumination.

The result showed some very perceptible deviations from the rule generally accepted, which may be called the reciprocity law. Michelke gives thus the following figures for a plate from Herzog.

Illumination.	Calculated time of Exposure.	Correct time of Exposure.	Deviation.
1	1	1	——
$\frac{1}{4}$	4	4,8	20%
$\frac{1}{16}$	16	20	25%
$\frac{1}{25}$	25	32	30%
$\frac{1}{36}$	36	48	33%

In the first column are mentioned the existing illuminations for the dry plate, in the second column the time of exposure, calculated after the reciprocity law,

in the third column the time of exposure found by experiment, and in the last column the deviations of the calculated from the correct time of exposure. Thus it will be seen that the percentage deviation increases with the reduced illumination.

The practical conclusion from this is, that for inferior illuminations it is well to add one-fourth to one-third to the time of exposure, corresponding to the inferior illumination. Experts are in the habit to generally expose a little too long in inferior light, knowing that an over-exposure can always be remedied again by a suitable development.

Our opticians are working zealously since the existence of the new optical glass of Jena. There is new life in the manufacture of lenses. But the accomplishments of the opticians can hardly keep pace with the pretensions of the public. One is not satisfied any more with the wide-angle lenses of 90 degrees, although too great an angle may easily give a strongly exaggerated foreground. Hartnack introduces now with his pantoscope a still greater picture angle. Dr. Eder writes about this: The front and back lens show a diameter of 23 mm., without the mounting. The focal distance was equal to 136 mm. The largest diaphragm opening had a diameter of 8 mm., resulting in a relative opening of one-seventeenth. The effective opening, with regard to the diameter of the largest effective bundle of rays, was 9 mm.; therefore the effective relative opening is equal to one-fifteenth. The diameter of the largest visible picture circle of about 350 mm. corresponds with a visual field angle of about 98 degrees. The largest plate covered with a completely sharp picture by application of the smallest diaphragm is 18 x 24 cm., and the sharpness of the picture reaches to the edges. The time of exposure by application of the smallest diaphragm $\frac{f}{(100)}$ of a well-illuminated landscape was from four to six seconds. The objective is free from light spots, spherical aberration and focal difference, and excels by a very good distribution of the depth of sharpness to the edge of the picture, and no disturbing influence of astigmatism on the whole picture field is observable.

The instrument appears, therefore, to be excellently suitable for landscapes, architectural views and interiors, for which a large picture angle is required.

Photography is a curious art. It requires optical, chemical, artistic and other knowledge. These we find seldom combined in one person. It is therefore not to be wondered at that a good deal of scientific nonsense passes through the photographic journals.

Mr. Petry thus recommends for the restoration of eikonogen which has become brown, to put the same in water, mix the solution with tartaric acid, sulphuric or muriatic acid, and to wash out the precipitate which has formed. The product which thus originated is nothing but the free amido-beta-naphtha-beta-monosulphonic acid, whose soda salt is the eikonogen.

But Mr. Petry—quite significant—designates it with the nonsensical name of "oxide of eikonogen." This is of course quite significant, but not for the preparation. This may serve as example of what chemical nonsense is oftentimes published in photographic circles. We could furnish quite a number of similar publications. On the other hand it has to be acknowledged that the importance of photography as a means of observation is recognized more and more from day to day by the scientist. This was shown recently by a lecture of Dr. Müllenhoff about volitation (flying), held at the meeting of the Association for Aeronautical Improvements and Advances.

The problem of flying has already engaged numerous workers. Natural philosophers, physiologists, mathematicians and engineers have made observations, measurements and calculations about the motions in flying; but the results of the several investigators deviated in a manner inspiring very little confidence.

The reason of this failure was the incompleteness of observations. By direct observation with the naked eye the motion of the flapping of the wings cannot be determined of any bird. All calculations which had been made by reason of older incomplete observations had to lead therefore to erroneous results. Only by the introduction of artificial methods of observation have we succeeded lately in determining exactly the several proceedings during flight. The merit in the first line belongs to the French physiologist, Marcy. He has investigated without cessation for the last twenty years the proceedings of motions of different animals, and has cultivated thereby quite new methods of observation, methods which will admit the comprehension of the finest details of motion.

By exact measurements Marcy determined the greatness of muscular power; by a peculiar registering apparatus, particularly constructed for this purpose, he measured the rapidity of muscular concentration and the duration of lifting and lowering a wing; similar arrangements served to fix the course which the several points of the wing have to pass, and for the observation of the deviations of the body of the bird going up and down pending the duration of the flapping of the wings.

The graphic method of Marcy gave therefore the possibility of noting by the animal itself rhythm and form of the motion of the wings. Still this method alone is not capable of giving a clear picture of the exact condition the animal is in at certain periods of the motion, indicating only at certain intervals the course of the motion.

Instantaneous photography offered at last the desired supplement, and the French scientist has now indeed succeeded in gaining the long-looked-for point; he has obtained such complete and sharp pictures from all the different movements and changes of the body during the flying, that the exterior of the proceedings can easily be followed in all its details.

Marcy proceeded in a thoroughly original manner, by applying photography for the observation of flying. Not satisfied with the representation of the small single pictures purely in outlines, as already obtained by Muybridge, he endeavored to obtain a series of pictures, formed of numerous single representations, which might be obtained during one motion. His "photographic gun" permitted him to reach the next point. But in this proceeding he lacked the representation of the forward movement of the whole animal, so important for the proper judgment of motion, as well as the determination of time, required for each separate act of flight. Marcy succeeded in covering the deficiency by application of "chrono-photography"; that is, by producing upon one and the same plate at short, exactly-timed intervals, numerous pictures of a flying bird; the disturbing obstructions of one picture he managed cleverly to avoid by the next picture and in manifold ways, and obtained a series which, united in the stroboscope, gave the full impression of the side view of the animal.

All representations heretofore gave exclusively projections of the proceedings of motion upon a plane; the thereby unavoidable contractions were apt to easily lead to mistakes. This source of defects Marcy knew also how to evade by

executing pictures of a flying animal from three different directions vertical to each other. Marcy photographed also flying birds from the side, from the front and from above in a series of views. By now placing the pictures of correspondingly equal movements comparatively together, and arranging them alongside each other, the motion of every point, and at the same time the complete form of the animal in all its parts, could be brought to view. To facilitate the conception of these proceedings, Marcy had relief figures made of wax, and later on of bronze ; these are copied from instantaneous views, and give—particularly when united in Anschütz's "Schnellseher"—a complete representation of the motions in flight.

A detailed representation of the whole of Marcy's investigations has been published, under the title "Le Vol des Oiseaux," by Masson, Paris, 1890 ; this work, as well as numerous smaller publications of Marcy, referring to the same subject, were laid before the meeting by the presiding officer, who at the same time called attention to the labors of Anschütz, who obtained likewise a numerous series of views of flying birds.

A subject which has been discussed already for months is the acquisition of good red glasses for the dark room. Those at present in the market may be satisfactory for the development of the ordinary plate, but not for the development of orthochromatic plates, because they admit mostly the passage of green light. It is a fact now, that good red glasses are not so easily obtainable. Those which do not admit the passage of green light are mostly too dark. But a dark-room lamp should be so bright that at a foot distance it will still permit the reading of ordinary type without the passage of green light. With satisfaction, I see that manufacturers of glass begin now to test their red glasses through the spectroscope, as, for instance, Mr. W. Grosse, of Berlin ; but it will take some time before the introduction of good red glasses will become general. I would advise, therefore, practical photographers and professionals to have two glasses put together : a copper flashed ruby glass and a pinkish gold glass. The latter casts the green light completely off, without diminishing the brightness of the red glass.

BERLIN, January, 1891.

LANTERN SLIDES BY THE WET-PLATE PROCESS.

BY T. C. ROCHE.

It is a well-known fact to all workers in the positive process for lantern slides and transparencies that the old wet-plate methods give to-day the best results in the matter of detail in the pictures and clearness in the high-lights. In order to give amateurs an opportunity to try the wet-plate process for some of their work, we have thought that a concise and clear description of the *modus operandi* of the various steps would prove useful and interesting. Since every amateur has some place of resort where he does his usual work of making negatives, and where he keeps his regular stock of chemicals and apparatus, the few additions necessary for the practice of the wet-plate process will be found to add but little to his regular stock-in-trade already acquired.

The first step is to select glass plates that are thin, clear, free from bubbles and striæ, and make them thoroughly clear by rubbing with whiting and water, using a clean soft linen rag, and washing under a faucet with good clear water.

If the water is inclined to be turbid tie a piece of clean linen stuffed with some loose cotton over the exit of the faucet to serve as a filter, and if it is used frequently remove and wash it out often.

While the plates are still wet pour upon them a solution of albumen. This solution is made as follows:

The white of one egg.	
Ammonia	5 drops.
Water	10 ounces.

Put these into a clean sixteen-ounce bottle together with some broken glass, and shake well to break up the albumen. Filter what you need of this mixture through absorbent cotton into a graduate for use. While filtering see that the neck of the funnel touches the side of the graduate to prevent the formation of bubbles. The albumen solution should be poured upon the concave side of the glass plates and moved around quickly so as to cover the plate uniformly without allowing any excess to flow over the edges. This is done by holding the plate in the left hand by one corner, pouring the solution on the upper right hand corner, and moving from side to side until the entire surface has been covered by the fluid (see Fig. 1). Place in negative rack to *dry* in a place free

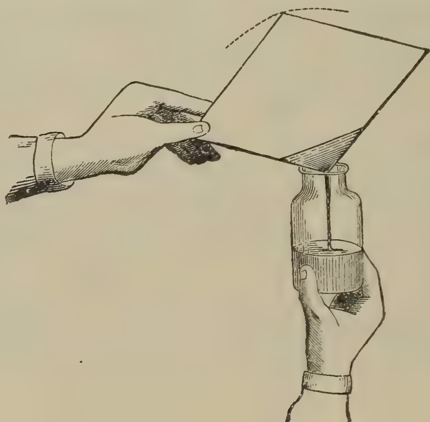

Fig. 1.

from dust. Glass plates so prepared will keep a long time. The coating is to prevent the collodion film from slipping off during subsequent operations. A stock of these albuminized plates should be made at one time and stored, with tissue paper between them, when thoroughly dry.

The next operation is the preparation of the silver bath used for sensitizing the collodion film. To make this take:

Silver nitrate (pure)	1 ounce.
Distilled water	12 ounces.

When solution is completely dissolved add four grains of potassium iodide dissolved in half an ounce of water; shake well for some time, and filter through clean white filter paper into a clean bottle. Add to the filtered bath enough chemically pure nitric acid (three or four drops) to make it turn blue litmus paper decidedly red, and it is ready for use. All these operations can be undertaken in ordinary daylight. The silver bath is kept in a bath-holder which carries a dipper (see Fig. 2). A bath-holder for 7 x 9 plates is a good size, and if furnished with a cover evaporation is prevented and dust excluded.

The following operations may be carried out in the dark room, where you may use plenty of yellow light, as the plates are not very sensitive to that color.

The albuminized plate is now coated with collodion. For this purpose use Anthony's New Negative Collodion, adding about 1 ounce of a mixture of equal parts of alcohol and ether to 8 ounces of collodion and place in a collodion bottle for use (see Fig. 3). Lantern slides require less density than other transparencies, like those used in windows, etc. In coating a plate with collodion hold the glass, albumen side up, in the left hand between the thumb and forefinger, and pour some of the collodion upon the upper right-hand corner.

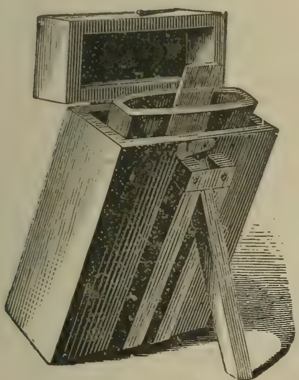

Fig. 2.

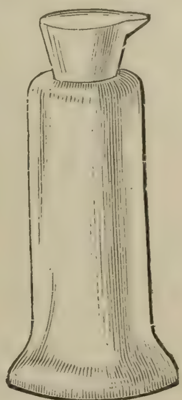

Fig. 3.

Now tilt the plate so that the fluid flows to the upper left-hand corner, then to the lower left-hand corner, and finally incline the lower right-hand corner until the excess of collodion drains into the bottle, which is still held in the right hand, rocking the plate from side to side during the draining to prevent the formation of streaks upon the surface, caused by irregular drying (see Fig. 1). Cork the collodion bottle, and in a few seconds the collodionized plate will be ready for sensitizing. A word of caution is necessary here. *While using collodion do not go near an exposed gas flame*, even if surrounded by a chimney, as the ether with which the fluid is prepared is extremely inflammable.

(*To be continued.*)

THE PHOTOGRAPHIC PROCESS.

BY CAPTAIN ARTHUR FREIHERR VON HÜBL.

(*Continued.*)

WITH regard to the too powerful action of the blue rays, this can easily be removed by application of a yellow transparent medium inserted between the object and the photographic plate. If, for instance, a yellow-colored glass plate is placed before the photographic objective, all blue rays reflected from the object will be absorbed by such plate, and do not therefore reach the sensitive plate, while all other rays are passed unchanged through the yellow bundle of rays, and can exercise their action upon the light-sensitive film. The optical properties of the bundle of rays have therefore to be fitted to the nature of the photographic plate. If this is greatly blue-sensitive, an intensely yellow-colored

film has to be selected ; if it possesses a strong green-sensitiveness, the bunch of rays must also absorb a part of these rays.

The assertion, made so often, that the coloration of the bundle of rays should be suited to the blue contained in the original, that therefore objects which contain no blue can be photographed without yellow glass, is entirely erroneous. Every original which contains blue-reflecting colors (white or green), besides such that lack this kind of rays (yellow, orange, red), requires in reproduction not only so-called orthochromatic plate, but its color sensitiveness has also to be harmonized by a yellow bundle of rays. A brown-toned photographic silver print, for instance, contains no blue, but, on the contrary, white, which acts through its blue rays. By application of a strong blue-sensitive orthochromatic plate the lights become too powerful, and the action of the white parts has therefore to be reduced by a yellow bundle of rays, so that the details in the brown shadows can be fully brought out.

Professionally a yellow-colored glass plate is mostly used, which is arranged in front or behind the objective or in place of the diaphragm, and a cell filled with a colored liquid is also applied. The glass plate or cell must be formed completely plano-parallel to prevent loss of sharpness to the optical picture by such arrangements. If this is not the case the rays radiating from every point of the objective will not cross any more at a single point of the picture plane, and the picture will appear less sharp in proportion to the picture's width. For reproductions of line drawings with objectives with great focal distance only very carefully polished plates can be employed, and in this case—for copies of paintings they may be used—the yellow mirror plates, glasses coated with aurantia, collodion, yellow collodion films, etc., are completely useless.

A cell made by C. A. Steinheil for this purpose, whose inner hollow space has a diameter of 10 cm., gives satisfactory sharpness for picture widths of less than 1 m.; for larger picture widths the delineation was not so sharp. This firm is also in favor of arranging the yellow glass in front of the objective, as a chemical focus might appear by placing it behind the same. Aside from the difficulties in finding a faultless yellow glass, a considerable loss of light takes place, particularly when the glass of the cell is pretty thick. Its application may be avoided in two ways : the illumination of the original with yellow light, or the yellow substance serving as a bundle of rays is changed to the yellow plate.

The yellow illumination of the original can easily be executed with electric light by putting yellow glasses of corresponding color in front of the lamp. The electric incandescent light is, besides, much richer in yellow rays than the sunlight ; if the preparations used are, therefore, not too blue-sensitive, the wrong action of the blue rays is prevented in a sufficient manner, in certain cases even without any extra arrangements.

This removal of the bundle of rays into the sensitive film finds application in the collodion emulsion of Dr. E. Albert, which is sensitized with a mixture of eosin-silver dissolved in ammonia and picrate of ammonia. The bromide of silver particles colored by eosin-silver are surrounded by a coating of yellow-colored collodion, which acts quite analogous to a yellow glass in front of the photographic plate.

As a second imperfection of the methods now in general use the fact is mentioned that the plates employed for taking colored objects do not possess that

sensitiveness for green, yellow and red rays which they should have, corresponding with the brightness of the same. So, for instance, a bromide of silver plate sensitized by cyanin is sensitive only to blue and yellow-orange, but it lacks the capability completely to reproduce the spectrum green and red.

But this circumstance is of less significance for photographic practice as one would be led to believe. The practical photographer has always to do with pigments, and these never reflect only a certain color ray—only homogeneous light—but always a great number of different kinds of rays, which correspond to a larger space of the spectrum. A coloring matter of bright yellow (corresponding to the spectrum line D) reflects all rays from the green-yellow to the red-orange, and absorbs only the red and violet to green; to photograph, therefore, this yellow, it is not necessary that the plate should be sensitive for the spectrum yellow, it is sufficient if sensitized for yellow, green or orange. With a cyanin plate, which lacks entirely the sensitiveness for spectrum red, a color surface can still be reproduced which appears red to our eye, the red pigment reflecting not only the red, but also the orange-colored, yellow and violet rays.

If we look at a painting in homogeneous yellow sodium light, every color impression will disappear; it appears as a gray drawing, which, by its shadowings, produces an impression corresponding to the painting. White and yellow appear lightest, then follow orange, green and red, while blue shows darkest. Only the bluish red, therefore red-violet, appears, as easily explained, too dark.

Exactly the same result would be furnished by a plate sensitized for spectrum yellow, a result which is completely sufficient in all practical cases.

It is therefore fully sufficient if a plate is sensitized for one kind of rays, which lay in about the middle of the spectrum between red and green. The pure yellow of the *D*-line answers, moreover, the best, as this color species must be produced the lightest. Unfortunately there is no coloring matter yet which would answer these conditions, and the two coloring matters have to be combined, which confer to the plate two maxima of sensitiveness on both sides of the *D*-line, to obtain quite satisfactory results. Eosin sensitizes for yellow-green, cyanin for orange; the former gives, therefore, red, the latter green, pigments, too dark. If both coloring matters are mixed completely corresponding actions are obtained.

All photographic negative processes can be applied for color-correct views if a suitable color-sensitizer is introduced into the sensitive film. In practice the coloring matters mostly preferred are those of the eosin group, which not only sensitize powerfully, but possess also as halogen derivations a certain similarity to the haloid salts, and support therefore the formation of clear and strong negatives. Unfortunately all eosin plates lack the necessary red-sensitiveness. If this is absolutely required it is imparted by cyanin, sometimes by chlorophyl. The treatment of red-sensitive plates, their preparation, the development, etc., is difficult and inconvenient, a harmless illumination of the dark room being not possible. It is a necessity, therefore, to work in an almost dark room.

The wet color-correct collodion process was first introduced by Cros and Decros de Hauron into practical life after H. W. Vogel had proven, in 1873, the photographic action of the less refractive rays upon colored bromide of silver films, and is also at present frequently applied after the formulas published in 1878, which have not been changed much since that time.

The plates are excellently green-sensitive, and require, therefore, only yellow

glasses, and furnish brilliant negatives. The celebrated reproductions of paintings by Hanfstängl, of Munich, and Braun, in Dresden, have been produced with wet eosin collodion. An essential disadvantage of this process is its insensibility (eosin-silver acting similar to chloride of silver by application of the physical development, direct sunlight being, therefore, required for difficult reproductions of dark oil paintings). The plate lacks the red-sensitiveness, and by application of a yellow bundle of rays red-violet pigments cannot be reproduced.

But it is preferred to remedy this deficiency by suitable negative retouching, instead of making the process complicated and uncertain by using chlorophyll. Cyanin, on account of the acid silver baths, cannot find application.

(*To be continued.*)

LANTERN-SLIDE MAKING.

BY EDGAR G. LEE.

[A Communication of the Newcastle-on-Tyne and Northern Counties' Photographic Association.]*

CONFINING my work almost entirely to the production of lantern slides, I have thought it expedient to take up a portion of your time to-night by contributing a few rough notes on this very interesting and important branch of the photographic art.

At the present day by far the most popular process is the gelatino-bromide; although the collodion, both wet and dry, and other processes give more latitude as regards the production of a good slide from an indifferent negative. First of all, it is necessary to consider what constitutes a good slide. One in which the highest lights are represented by clear glass, and the deepest shadows are of such a density as to be easily penetrated by a fair average light in the lantern. A good slide need not be composed of, say, equal proportions of clear glass and opaque deposit, like more than one make of commercial slides in the market. So long as we have a trace of clear glass to add brilliance to the picture on the screen, it may be with advantage as seen out of the lantern to appear a trifle thin.

To produce this good slide, having the characteristics which I have mentioned above, a negative is required showing considerable contrast. Personally I prefer one of the type which yields a brilliant or plucky silver print. Whilst on the one hand a negative of the most extreme density will make a passable slide, thinness and want of contrast of the character which is suitable for bromide printing is for slide work absolutely hopeless.

Coming to the actual working, we have two methods: we may reduce in the camera or print by contact from small negatives. To the latter method I confine myself almost entirely, as nearly all my negatives are quarter-plates. The first point to be considered is, naturally, exposure, which may be made to a paraffine lamp, gas burner or magnesium wire, daylight, of course, being too strong and uncertain. Gaslight is, generally speaking, most useful, and exposures with the printing frame two feet from an average burner may run from thirty seconds to ten minutes, varying according to the density of the negative. For very dense negatives, exposure to magnesium wire is to be decidedly recommended. With a negative verging on thinness the exposure must be

* From author's proofs.

fairly exact, but with a dense negative and certain brands of lantern plates the latitude is simply enormous, and much greater than is usually supposed. With such a negative the exposure may be ten times the normal, and a perfect slide result from it, of course varying in tone according to the extent of the exposure. I have observed that the general tendency of beginners is to under-expose, which is fatal, as the image either develops up patchy, or veils over before density is obtained. A lantern plate can not be forced in development.

As to development, we have the choice of four reducing agents: ferrous oxalate, pyro, hydroquinone and eikonogen. Each and all of these are capable of producing equally good results in the hands of careful workers. The easiest, by reason of the latitude it permits, is hydroquinone, the tone being dependent partly upon the negative, partly upon the exposure, and in no small degree upon whether the development is rapid or gradual, a remark which will be found to apply to any developing agent. It is not my intention to recommend any one formula, believing as I do that there is nothing magical in any prescribed combination of chemicals. My advice would therefore be to choose a well-tried and reliable formula and stand by it.

For warmth of tone pyro is, without doubt, the best developer, and as the tendency is now in that direction, it merits our attention. There is no difficulty in its use if we remember its staining properties, to counteract which it is always employed with a much larger proportion of preservative.

The image when fully developed has an over-done sunk-in appearance, and unless this point is arrived at, the slide when taken from the fixing bath will be found much too thin.

After fixing in a perfectly clean hypo bath and a thorough washing, the slide will in all cases be the better for a short immersion in an alum and citric acid bath, which clears up the picture and improves its brilliance. If too dense or fogged beyond the capacity of the acid bath to reduce, the ferricyanide of potash and hypo reducer (made distinctly alkaline with ammonia) should be resorted to.

Intensification at its best (which best may be represented by mercury and cyanide of silver) is but an unsatisfactory proceeding, and much the better alternative is to make another slide. Intensifying by mercury, followed by various alkalies, yields warm tones, varying with the agent used, many of them very fine, but all of doubtful permaneney.

After fixing and washing, slides may be toned in a gold and sulphocyanide bath through a long range of bluish tones, useful for moonlight effects.

Mounting calls for no particular mention, but I cannot refrain from adding a vigorous protest against the continued use of masks of circular and other eccentric shapes. Broadly speaking, the oblong form suits most subjects and produces the best effect. A safe rule for guidance is to fit the subject to the mask when taking the negative, and not to fit the mask to the subject at the last moment before binding the slide.

Enclosed find P. O. order for subscription to Bulletin. The Bulletin furnishes many new ideas, and the illustrations alone are worth the price per year.

Mrs. W. H. Stanley,
San Mateo, Cal.

HOW TO WORK THE CARBON PROCESS.

BY P. C. DUCHOCHOIS.

(*Continued.*)

The Negatives.—Negatives somewhat more intense than those made for printing out on silver paper give the best results. However, good proofs may be obtained from any negative, so to speak, by varying the strength of the sensitizing solution and, also, by using freshly bichromated tissue for weak negatives in order to obtain vigor, or, for strong ones, the same two or three days old, when it yields better half-tones.

Printing dodges are also resorted to. That the most commonly employed consists in stretching on the back of the negatives a sheet of mineral paper, so called, upon which the retouches are made by rubbing graphite, chrome yellow, pink or blue color, to strengthen the shadows or the whites as the case requires. These retouches can be made equally well on the negatives, but it is always advantageous to cover the printing-frame with tissue paper.

Printing.—It is best to print the carbon tissue in the shade. The exposure is regulated by means of a photometer. We use a series of four small negatives of graduated intensity, made on the same plate as advised by Mr. Loeffler. The photometer is employed in this manner: We have said that the tissue prepared for negatives of the ordinary intensity is practically of the same sensitiveness as silvered albumen paper printed right; hence, by printing side by side a silver proof from the pictures in the photometer and another from the negative, and when the latter is printed right—that is, not over-printed—by comparing it with the prints from the photometer, that to which it corresponds in shade will serve as a test to ascertain when a print on carbon tissue is sufficiently exposed.

Development.—The proofs are developed within two or three hours, for the luminous action continues pretty actively in the dark after the insolation, and this for a long time; thus, in a certain period, the tissue refuses to adhere on a rigid support or the image cannot be developed; and a proof rightly exposed in the morning behaves as one over-exposed if developed in the evening.

To develop, a glass plate—well cleaned, of course—is rubbed with talc, carefully dusted and coated with the plain collodion whose formula is given above. Then, when the film is set, the plate is immersed in water, etc., and upon it the tissue, previously soaked in water, is applied and squeezed into contact. A number of plates can be thus prepared, setting them face to face, one upon another, for the image should not be developed at once. The adherence is greater and the proofs finer and devoid of defects when the development is made half an hour, and even an hour, after. The essential point is not to let the tissue dry.

The time the tissue should be allowed to absorb water before transferring and the temperature have an importance which should not be neglected. If it does not remain long enough to be soaked through, small invisible air bubbles are formed on its surface, and interposing themselves between the image and the support form minute brilliant, silver-like spots on the finished picture, and, if the temperature of the water is above 20 degrees C., the gelatine will likely be more or less reticulated. Fifteen degrees C. is a safe temperature, except, however, when the thermometer is in the nineties (32 to 36 degrees C.), when the water should be at the temperature of the melting ice. As a rule the tissue should

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Half Morocco; Brown

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M^{LLE} C. FOULD. PINX.

THE FORTUNE SELLER.

PHOTOGRAVURE BY THE GEBBIE & HUSSON CO. LIMITED, PHILADA

remain in the cold water until it becomes flat and shows a tendency to curl up. It is at this very moment that it should be squeezed on the support.

To develop, the plate with the tissue adhering to it is placed in water heated to about 30 degrees C., where it is left, rocking the tray occasionally, until the paper rises by itself at the corners, when, by taking hold of it by one corner, it is stripped off, leaving behind the image buried in soluble gelatine. Should the paper offer any resistance, the gelatine should be allowed to become more soluble by increasing the temperature of the water. There is, in fact, no objection to this. The plate—and this is a good method—can be placed in an upright position in a tin box, made *ad hoc*, and left therein in warm water until the paper detaches itself and the image is partially developed. This done, the plate is held in an inclined position on a tray filled with water at 35 degrees C., which is dashed with a spoon on the image to clear it from the non-acted-on gelatine. See our former paper in the BULLETIN.

Now one can judge whether the exposure is right. If it is too short the half tints in the shadows are washed off, unless the negative be too intense, when a similar defect also occurs in the whites; if it is too long, either the image is with difficulty cleared or remains undeveloped. Then warmer water to which some sodium chloride or a warm solution of potassium sulphocyanate * at 2 or 3 per cent. may be added to assist the solution of the gelatine acted on. When the exposure is correct the image is developed to perfection with water at from 35 to 45 degrees C.

After development the plate is washed under the tap, then flowed two or three times with a 5 per cent. solution of alum, then washed again and finally allowed to dry spontaneously.

It is objectionable to immerse the plate in the alum solution for any length of time; the gelatine is considerably hardened—which is not necessary—and more liable to crack by being thoroughly desiccated.

The proofs thus obtained cannot be used as transparencies; they will not hold on to the plate for a long time. They should be transferred on to insoluble gelatine paper. This paper is prepared by floating on a solution of 1 (one) part of gelatine dissolved in 8 parts of water, adding little by little one-eighth part of a solution of chrome alum 4 : 100. For use this paper is immersed in tepid water—about 35 degrees C.—until the gelatine is softened, then squeezed into optical contact on the proof previously damped in cold water. When dry the whole is stripped off.

For transparencies the sensitized tissue is dried on a plate simply waxed and developed on a thin glass plate prepared with the following substratum, operating as explained: Dissolve 28 grams of gelatine in 250 c.c. of No. 8 acetic acid, add 750 c.c. of alcohol at 95 degrees, and 60 c.c. of a solution of chrome alum of 4 per cent. Filter. The substratum should be allowed to dry thoroughly before using the plate.

When the transparencies are not printed too dark they can be toned and at the same time intensified by the following process, which dyes them with a splendid and transparent purple-black color.

Prepare three solutions as follows:

A.

Ferric sulphate	5 grams.
Water	100 c.c.

* A solution of potassium sulphocyanate even develops the picture in the cold.

B.

Sodium carbonate	2 grams.
Water	100 c.c.

C.

Gallic acid	5 grams.
Water	100 c.c.

Dissolve the gallic acid by heat. Filter each solution. They keep well.

To tone, the plate is immersed for, say, ten minutes in A, then after rinsing slightly it is placed in B for the same period. Rinse again and flow the plate with C until the desired effect is obtained. If a solution of pyrogallol be used instead of gallic acid the tone turns to a green, and to a green bordering black when catechu is used.

A more simple process is to flow the plate with a mixture of about equal volumes of

A.

Ferrous sulphate	5 grams.	
Acetic acid No. 8	5 c.c.	
Water	100 c.c.	Filter.

B.

Gallic acid	5 grams.	
Water	100 c.c.	Filter.

When toned the plate is well washed, then flowed once with the alum solution and again washed.

It sometimes happens that in drying the image intensifies more than necessary. It can be cleared with a weak solution of oxalic acid.

The diapositives employed in photo-engraving or to make duplicate negatives by the same—carbon—process are intensified with potassium permanganate 1 (one) per cent. in water. The tone is olive green. If the picture is afterwards treated with pyrogallol it turns sepia brown, and black by gallic acid.

Many other colors can be obtained by chemical changes or dyeing operations which suggest themselves to the chemist. Amongst the dyes the anilines give the most beautiful colors.

(*To be continued.*)

[*From the British Journal of Photography.*]

COPYING BOOK ILLUSTRATIONS AND SIMILAR OBJECTS BY MEANS OF ARTIFICIAL LIGHT.

BY J. N. ARMSTRONG.

(Continued.)

SOME may imagine that the intervening of a sheet of glass between the picture and the lens might have a detrimental effect in the way of causing a want of sharpness. Such objections, however, are purely fanciful in actual practice—they don't exist; and not only will it be found that the negatives are absolutely sharp when proper attention has been paid to the focusing, but that an actual benefit accrues from the use of the glass in the way of overcoming the presence of the grain of the paper. Neither does the glass in any way tend to cause the presence of reflections, so troublesome at times when copying objects which have a glazed surface. On the contrary, the glass is just about the very best means an operator can employ to detect the presence of these troublesome ghosts when they are present, for by a cursory glance at the face of the picture it is at once seen if such be apparent, and when noticed they are easily removed. Of this I will have occasion to speak later on, when I come to describe the manner in which I place the lights that I copy with. No one undertaking this work

ought to discard the use of a sheet of glass between the object being copied and the lens, even should it be only placed over the pages of a book and not used in a printing-frame as described. When it is required to copy illustrations bound up in books, then of course, an ordinary printing-frame is not deep enough in its rebate, and some other means must be employed to hold the picture up; but an ingenious worker will not go on long before some simple contrivance applies itself to his mind, and which will answer his purpose. In my practice I employ a box frame; by this I mean a frame like a printing-frame, but one having a very deep rebate, and which carries a good stout sheet of glass. The page to be copied is placed flush up against the glass, and any unequal thickness of the book is made up with pads or cards, etc., till the back of the frame presses equally on both sides of the book when the back is sprung up with the springs.

When using printing-frames or any other contrivance, it only requires but a very little practice to teach the worker how to contrive some simple means not only of holding the picture flat and square up against the sensitive plate, but also to so place the picture as to register at or about the proper height on the ground glass. One very good and useful hint to this end is to paste or gum on to the ground glass of the camera, exactly in the center, an ordinary lantern mask, for when such is truly adjusted so as to register exactly correct on, say, a 3¼ x 3¼ plate when inserted in the carrier, not only will the worker be enabled to make even small-sized negatives with a certainty of their being properly registered, but when using larger-sized plates he will have as good a guide as any for the proper adjustment of his picture when focusing. A little careful thought to such minor matters as these will at the beginning go a long way toward enabling a worker to work with much ease and certainty, no matter what size plates he is using. When, however, copying objects for the purpose of finally making lantern slides from his negatives by contact, there is no need to employ plates larger than 3¼ x 3¼; and when, as I have said, the lantern mask is so placed on the ground glass of the camera as to exactly coincide by register with the plate in the carrier, there will be at least some little economy practiced in the way of cost of working.

In my next I shall describe the method I adopt for lighting the objects to be copied, and state how any worker can with ease rig up a suitable arrangement in any house having a supply of gas.

(*To be continued.*)

[*From the British Journal of Photography.*]

PHOTOGRAPHERS' EYESIGHT.

BY G. R. BAKER.

Does practical photographic work unduly try the eyes; and, if so, what precautions can be taken to preserve the eyesight from unnecessary strain?

FIRST of all, the sudden transition from a dark room into full daylight should be avoided, for if the eyes are predisposed to weakness, this will help to develop it, and it is therefore wise to so arrange the position of the dark room that the operator has to come into a moderately lighted room or partition before the full light of day has to be faced. If from the structural form of the building this is not possible, the photographer should not neglect to put on a pair of medium-tinted (neutral) *pince-nez*, or spectacles, the former being best, as they can be dropped after being worn a few minutes, the silk cord around the neck preventing harm coming to them. If the operator is short or long-sighted, the necessary or most comfortable power can be worked on the tinted glass. The great thing to avoid is any severe muscular or optical change. Nature has endowed the healthy eye with a natural automatic diaphragm to contract or enlarge according to the amount of light, but it will in time revolt against a continuation of sudden strains caused by the constant alternative

use of the eyes in strong light (such as one oftentimes gets in the studio) and then in the dark room. The absence of this adjustment is iritis.

Fumes and Ventilation.—There is no doubt that the eyes of some people are very much affected by fumes, and it is therefore of great moment that the dark room should be properly ventilated; and as so many places, such as bath rooms, are utilized by amateurs as dark rooms, which only have a window for a ventilator, it follows that if this is blocked up to exclude the light, the vapor of ammonia and kindred volatile chemicals, as well as fumes from paraffine lamps when used, cause the eyes to water and smart.

Weak Sight.—If the eyes have any difficulty in seeing small print, or when retouching painting, etc., a suitable convex or other glass should be resorted to, and each eye should be tested separately on test types, or, if possible, with a good optometer, so that the focus of the eye may be determined and the amount of accommodation or natural adjustment shown. The right time to take to glasses may be known when, after reading or working for one or two hours in a reasonably bright artificial light, the smaller types used in reference books, such as brilliant or pearl, cannot be easily read, or the figures in a "Bradshaw," or other time-table having small print and figures, are difficult to make out.

Over-sightedness (*Hypermatropia*) is often confused with ordinary old or weak sight, but it is quite distinct, for convex glasses improve distant vision as well as near by shortening the focus of the eye to that of normal vision, so that there is not so much muscular effort necessary to accommodate the sight to different distances, and in the majority of cases the same power answers for all purposes, whereas with presbyopic or old sight the distant objects cannot be seen with the reading glasses.

Optometric Tests.—By the optometers constructed on the plan of Dr. Smee, and since improved by various oculists and opticians, normal sight can be verified by the definite numbers down the scale that the letters can be read, and the near and far point of vision shows the focus and amount of accommodation. Generally, it is three and a half to nine when using the standard magnifying lens at the ends of scale to bring the readings down to a reasonable limit. If the eye is short-sighted, the range is then two to four, two and a half to six, or three to seven, according to the degree of myopia. If hypermatropic, the eye will see from four to fifteen, and even further; and in some cases the near point will be almost normal, while the distant point is near the bottom of the scale (100). This shows an excess of accommodation which, if allowed to be exercised, causes considerable fatigue, whereas, with the use of properly selected cover glasses the focus and range of vision is reduced to the normal, and hence the exertion on the muscular power of the eye-glasses.

Weak Sight.—The optometric range for old sight varies from four and a half to ten or eight to thirty, and with very old people, forty or sixty to eighty or a hundred. With short sight, where the near point of vision (by the unaided eye) is beyond seven inches focus, no serious trouble or difficulty is experienced in reading or working; but if the book or object has to be brought nearer than this, then concave glasses (even if of low power) should be used. It goes without saying that persons who are decidedly short-sighted, when once they realize what they lose by not seeing properly, and are well fitted, will use glasses from choice; but I have met people that have lived to past the age of middle life, and have never seen clearly beyond a yard or two from their face, and notwithstanding it was demonstrated what they lost, it required considerable persuasion to get them to take to the use of glasses regularly.

Astigmatism.—A great number of people suffer from this defect of vision caused by the lens of the eye being elongated in one direction, or not giving equal refraction in all meridians. It is detected by not being able to see radiating lines equally distinct, and is most troublesome when combined with weak or short sight. If no ordinary concave or convex lens gives the required assistance and corrects the defect, cylindrical glasses should be tried, and revolved in front of the eye (or the ordinary

glasses worn) until one of the necessary degrees is found to make all the radiating lines equally distinct.

Binocular Vision.—If the eyes are of different focus, or have different refractive power, the effort to see an object with both eyes will be considerable, especially when within a distance of fourteen inches; and the consequence is that either one eye by habit ceases to work with any vitality, or else considerable effort is made to see, more especially when tired. If on looking through a stereoscope or binocular glass the objects are blurred or double, extra care should be taken to test the sight, especially if it is previously proved that the instrument is in correct optical center. Sometimes it is impossible to get binocular or stereoscopic vision with instruments on account of the width between the eyes not agreeing with or being suitable to the width between the optical instrument, hence this matter should not be lost sight of. For instance, I have had on several occasions to fit binoculars to persons only two and a quarter inches between the pupils, and at other times as wide as two and three-quarters ; and it will be readily understood that the ordinary width binocular field and opera-glasses, and some stereoscopes (without lateral width adjustment), will not satisfactorily answer in either case, and so special instruments have to be made. Besides this, if the two eyes are different in focus, or require correction for astigmatism, stereoscopic effect will not be possible without considerable effort. Therefore I say to all photographers, have your sight tested if in any difficulty or doubt, and get the proper lenses fitted for the particular work you require to do just in the same way as you select a wide-angle or long-focus landscape lens, according to the amount of subject or distance of the view you wish to include when photographing.

Magnifying Lenses.—So long as they are used with judgment, there is no doubt they strengthen the visual power of the sight, for watch-makers are rarely troubled with any defect except a little short-sightedness ; but when using magnifying lenses for retouching or miniatures, care must be taken that they are large enough for both eyes to see comfortably through the lens, and that the focus is not too short for the diameter to produce distortion. Enough, I trust, has here been touched upon to show that eyesight is distinctly a photographic subject.

[*From Photography.*]

HELIOCHROMY.

BY D. WINSTANLEY.

I AM a "great believer" in photography in colors, and I am so because I have great reasons for belief. I have seen photographs in colors produced by Captain Abney. I have produced photographs in colors myself twenty-four years ago, and I have one on the table now beside me which I have only just taken from the frame, and which has occupied the last three days in its production by means which I shall presently describe.

I have read a good deal lately on the subject of heliochromy in the past records of our art, and a good deal of what I have read surprises me. I have not yet got my mind into the curious condition into which Mr. Joseph Wilson Swan had managed to get his when he wrote an article on this subject for the "Year Book of Photography" for 1870, and which commences on page 47 of that work. In that article Mr. Swan says: "It is possible to produce a photograph of the solar spectrum more or less colored with the real colors of the spectrum. I believe," he continues, "Mons. Claudet once showed me a plate with such a photograph upon it. Certainly I have seen one somewhere." And yet the object of his article, he says, is, "not only not to raise and nourish false hopes, but to dissipate and kill them." Mr. Swan was of opinion that "we have made no more approach to the realization of the indispensable conditions" of photography in colors "than we have to the discovery of the philosopher's stone," and though he did "not say that the discovery of either the one or the other

is an impossibility," he did "regard the pursuit of each of these objects as equally visionary." The reader will be puzzled to guess upon what ground a gentleman who has "certainly seen" a "photograph of the solar spectrum more or less colored with the real colors of the spectrum" should affirm that we are no nearer the discovery of heliochromy than we are to that of the philosopher's stone. And this is the reason given by Mr. Swan: "I look upon the colors in those photographs as produced by certain degrees of actinic action, and only connected by accident with a corresponding color in the object represented where such correspondence exists." Mr. Swan's reason then for believing we are as far from heliochromy as from the philosopher's stone is, briefly, because he thinks something which obviously might be, and which I say experiment proves to be, untrue. Photographing the solar spectrum in colors more or less like those of the original is not a new thing by any means. Ritter did this in 1801. Seebeck successfully repeated the experiment in 1810. Herschel in 1839 found that "the spectrum impressed upon a paper spread with chloride of silver is often beautifully tinted, giving, when the sunshine has been favorable, a range of colors very nearly corresponding with the natural hues of the prismatic spectrum." "Daguerre noticed" (I quote from Harrison's "History of Photography," page 117) "that a red house gave a reddish image on his iodized silver plates in the camera, and at an equally early date Fox Talbot observed that the red portions of a colored print were copied of a red color on paper prepared with chloride of silver."

Hunt, Becquerel, Poitevin, Niepce de St. Victor, St. Florent and others have obtained similar results, and so has Captain Abney, who obtained them by exposing silver plates to the action of the spectrum, either whilst dipped or after dipping in hydrogen peroxide.

I think, however, that all these experiments with the solar spectrum are experiments in the wrong direction, for in making photographs of such objects as we see around we very seldom, indeed, have pure spectrum colors with which to deal. The thing which looks red only does so because it reflects more of the red rays than of the rays of other colors; the thing which looks green, because it reflects more of the green rays, and so on. I know of no substance whatsoever which does not reflect white light; black velvet certainly does, though, of course, to only a very small extent indeed, and we may take it that the rays proceeding from any object by reflection, whatever the seeming color of the object, are in part composed of pure white light which dilutes and brightens the preponderating ray. To be able to take photographs in natural colors, *i. e.*, photographs of anything we see, we must be able to do so by means of the preponderating ray, even in the presence of all the others. Hence, though photographs of the spectrum have (to my thinking) demonstrated the possibility of making photographs in colors, it is perhaps useless to pursue the subject further in that direction.

At first sight it seems quite hopeless to expect that we shall ever be able to eliminate the results of all those colors which are not evident to the eye, but I hope to show that it is not merely otherwise than hopeless, but that it is actually easy. Everything is easy when you only know the way; and blessed is the man who can so use his reason rightly as to see the facts of science unmingled with the fictions by which they are hedged in and surrounded, blessed in the sense that he is likely to get understanding.

But let me get "down" to the tangible ground of observation and experiment. Many methods are given in Harrison's "History" and elsewhere by which color photographs have been obtained. The simplest method is one described by Hunt, and thus quoted on page 118 of Mr. Harrison's work: "A paper prepared by washing with barium chloride and nitrate of silver, allowed to darken whilst wet to a chocolate color, was placed under a frame containing a red, a yellow, a green and a blue glass. After a week's exposure to diffused light it became red under the red glass, a dirty yellow under the yellow glass, a dark green under the green, and a light olive under the blue."

It is not obvious to me that it can matter much what base is present in the salting chloride, and having no chloride of barium in the house I proceeded to work on March the 20th [1889—Ed.] in the following way:

Made a solution of common table salt, 40 grains to the ounce. Floated several sheets of common writing paper on it, of the kind I now employ. Floated each sheet for five minutes, and then dried. Floated them successfully for five minutes on a forty grain solution of argentic nitrate, on which small quantities of albumenized paper had been floated a year before, and exposed them wet upon a horizontal board before a window to the light of day. Placed about a teaspoonful of powdered chocolate on the board, and spread it out for purposes of comparison. As the sheets showed signs of drying, floated them again upon the silver bath, just for a moment, and to wet them merely, as it struck me that the wet condition might be an essential part of the experiment. As the light was very poor (it was afternoon, and raining hard) it took about a couple of hours to bring these silvered papers to the color of the chocolate guide, which, however, they matched quite well. Enclosed these sheets between the blank pages of a note-book. Prepared two printing-frames with such colored glasses as happened to be at hand, ruby, blue and iron-yellow. Cut off pieces of the silvered sheets (which, by the way, had been allowed to dry spontaneously in the dark), and fixed them in the frames. Exposed these frames in a window, regardless of the fact that the morning sunshine had access thereto, for it does not seem to me to matter about using diffused light only. Examined them with frequency during the next three days, and on the fourth dismounted the one which I have now before me. Result (according to myself and various members of my family): Under the red, pale red, or rose-color I should say; under the blue, a copperish green (like the dark patination on an ancient copper coin); under the iron-yellow (which is not a yellow at all to an eye which can distinguish colors, but a light variety of brown), the color was dark brown. These colors, which are not everything we want, are decidedly encouraging, and there can be no doubt but any one can get them who will take the very trivial amount of trouble which has been involved. The red is red, and a very beautiful tint of red, and it has not been produced, as Mr. Swan imagined, "by certain degrees of actinic action." The "copperish green" part of the paper never went through the rosy tint at all. I watched it too closely to let it have the chance without my seeing it, and devised another experiment to check that fact should it happen to occur. Where the copperish green prevails the print is enormously overdone, from a photographer's point of view, and the green shows semblance to metallic luster. But the experiment, be it remembered, is not yet complete. With the second frame I am awaiting the ultimate result. The picture obtained looks to me like a genuine photograph in pretty near the genuine colors, but hedged in, clouded and surrounded in various degrees by a common photograph in black.

But how shall we separate the two? I think I see the way.

[*From Journal of Photographic Society of India.*]

GRAPHOL DEVELOPER.

By Colonel J. Waterhouse, B. S. C., *Assistant Surveyor-General of India.**

Trials of a sample of this new developer just received from Europe seem to show that it is likely to be valuable, and particularly convenient for travelers, it being self-contained, and requiring nothing but dissolving in water to prepare it for use. It develops in a similar manner to eikonogen and seems to work well, with freedom from fog or stain and with fair intensity, but there has not yet been time nor is the weather suitable for thoroughly testing it.

According to a paper in the *Bulletin de la Société Française de Photographie*, for July, by the inventor Mons. Mercier, this compound contains eight different sub-

* From corrected proofs of author.

stances, the base being eikonogen. Among these substances he names borax, sugar of milk and carbonate of lithium. The borax, which acts as a restrainer with pyrogallic acid, tannin and pyro-catechin, acts as an accelerator and aid to development with eikonogen, hydroquinone and resorcin. The carbonate of lithium, though only very slightly soluble in water, is more powerfully alkaline than carbonate of soda, 37 parts of the first corresponding to 143 parts of the latter.

The graphol, as received, is a white or slightly yellow powder, and to form the developer it is dissolved in water in the proportion of 1 part of the graphol to about 16 of water, or from 25 to 30 grains to the ounce. It dissolves easily, forming a yellowish-green solution.

By treating the solution with dilute acids, eikonogen is precipitated, and a strong smell of sulphurous acid reveals the presence of a sulphite. The absence of effervescence, and the fact that the well-marked lithium line cannot be detected with the spectroscope, seems to show that there is no carbonate of lithium present. There is a very strong sodium line, and green bands show the probable presence of borax. It should be mentioned, however, that the sample of graphol came from Germany, and there is nothing to show that it was prepared by Mons. Mercier.

There has not been time to test its keeping properties; but from the fact that, though, when exposed to the air, it deliquesces without sensibly and rapidly discoloring, it may be hoped that it will be fairly stable; at any rate, far more so than eikonogen is in this country. The immense convenience of a developer which can be carried dry in small compass, will develop several plates in succession and really requires no weighing and measuring, is obvious, though it may not be so much appreciated by those who prefer to obtain the best results by careful adjustment of the ingredients of their developer, and who scorn the " press-the-button " tendency of the day.

PHOTOGRAPHY AND ELECTRICITY.

An account of some of the most novel and remarkable experiments ever recorded in connection with photography and electricity was read by Professor Minchin at the meeting of the Physical Society, held on the 16th inst. He prepared a variety of sensitive surfaces—ordinary "Liverpool emulsion," gelatine with eosine and other "aniline dyes" [more correctly, "coal-tar dyes"—Ed.], and finally with metallic plates, prepared in a manner quite new to photography, and which need not here be particularized. By coupling various pairs of these plates together and passing the electric current through them, he obtained distinct photographic effects capable of development by pyrogallic acid in the usual manner. Other pairs of plates he put together in a suitable liquid, and when light was allowed to play upon the cell, a distinct production of electric current took place. One battery of fifty such cells in series with an electrometer was exhibited, whereby the electromotive force generated by light falling on the cells could be caused to ring a bell, light or extinguish electric lights, etc. A discussion on the paper is to take place on February 15th, and, at the request of the President, Professor Minchin promised to show the experiments the same night. —*British Journal of Photography.*

As long as I do anything at picture-making and the Bulletin is published, I want a copy of every issue. J. M. Weldon, California.

All communications for the columns of the Bulletin *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

TWELFTH ANNUAL CONVENTION, BUFFALO, N. Y., JULY 14TH TO 17TH INCLUSIVE.

Meeting of Executive Committee.

"IROQUOIS HOTEL," BUFFALO, January 21, 1891.

MEETING called to order by the President. All officers present, namely:

GEORGE H. HASTINGS, *President;* S. L. STEIN, 1st *Vice-President;* W. STUBER, 2d *Vice-President;* G. M. CARLISLE, *Treasurer;* and W. A. DAVIS, *Secretary.*

Address of welcome by the President. Reports of the Secretary and Treasurer were then read. President appointed Messrs. Stein, Stuber and Davis as Auditing Committee, who reported that they had found the same correct, and the Committee were discharged.

The next Convention will be held on July 14th, 15th, 16th and 17th, at the Buffalo Park Association, Buffalo, N. Y. Dr. A. H. Elliott, associate editor Anthony's BULLETIN, was appointed a committee to report on the "Progress of Photography."

AWARDS FOR, AND RULES GOVERNING EXHIBITS, AND SUGGESTIONS TO ALL EXHIBITORS IN THE ART DEPARTMENT.

List of awards for 1891 are as follows: The grand prize will be a group in bronze, with marble pedestal, "The Victor," value $175, governed by the following rules and regulations:

Competitors for this award shall exhibit three plain photographs, illustrating Tennyson's poem "Elaine."

The size to be not less than 13 or more than 22 inches in length.

The pictures must be framed, either with or without glass. The award to be made for the most meritorious collection.

A diploma will be awarded for the second best collection.

Class A.—A beautiful marble bust, value $125, for the best exhibit of genre photographs.

Competitors for this class shall exhibit six photographs. The subjects are to be chosen by the photographer and appropriately inscribed; and size to be not less than 13 or more than 22 inches in length, and framed, with or without glass. The award to be made for the most meritorious collection.

A diploma will be awarded for the second best collection.

Class B.—One gold, one silver and one bronze medal, for the best collection of portrait photography, size 14 x 17 inches or larger.

Class C.—One gold, one silver and one bronze medal, for the best collection of portrait photography, size 11 x 14 inches or smaller.

Class D.—One gold medal for the best collection of landscape photographs with figures introduced.

Class E.—One silver and one bronze medal for the best collection of landscape photographs without figures.

One silver medal for the best collection of marine views.

One silver medal for the best collection of architectural views.

Class F.—One silver and one bronze medal for the six best plain enlargements, either in silver, bromide, albumen, carbon or platinum; the size to be not less than 18 x 22 inches.

PRIZES FOR EMPLOYÉS.

Class G.—One gold medal to the operator making and exhibiting the three most artistic photographs, size to be not less than 13 or more than 22 inches in length.

Class H.—One silver medal to the retoucher for the best set of six retouched negatives with prints from unretouched and retouched negatives.

Class I.—One silver medal to the printer for the most artistic printing, six prints to be exhibited.

Pictures exhibited by employés cannot be used from negatives from which employers exhibit.

Class J.—One silver medal for the best improvement in photographic appliances introduced since the last convention.

Class K.—Three prizes to be awarded for the best foreign exhibit of portrait photography, framed or unframed, delivered to the association free from all charges.

Exhibits in this class will be admitted to the United States free, by sending the same directed to W. A. Davis, Secretary of the

Photographers' Association of America, Buffalo Park Association, Buffalo, N. Y., U. S. A.

A diploma will be awarded for the most tastefully arranged exhibit.

Competitors for the grand prize or Class A cannot enter in Classes B or C.

Competitors in all classes, except Class K, must be members residing in the United States or Canada.

Applications for space must be made to S. L. Stein, 310 State Street, Milwaukee, Wis., who will forward blanks for entries and also send the number under which the exhibit is to be displayed.

The exhibitor must attach this number to his exhibit.

Entries to close on Saturday, June 20, 1891.

No space to be allowed after that time for exhibits.

All exhibits must be shipped so as to reach the exhibition building on July 8th, the Wednesday preceding the opening of the Convention, and all charges must be prepaid.

Exhibitors' pictures are to be known to the judges by number only. No name to be upon the pictures until after the awards are made.

The Executive Committee, who will appoint the judges, will hand in their reports, on or before the afternoon of the 3d day, to the President.

Should any exhibitor influence in any way, directly or indirectly, the judges during their term of office, in favor of any exhibit, it shall be the duty of the judges to strike their exhibit or exhibits from the lists.

Rules Governing the Judges in the Grand Prize.

The points to be considered are: 1st, Historic; 2d, Originality; 3d, Composition; 4th, Lighting; 5th, Technique.

Ten marks to be the highest for any one point, consequently 50 marks the most that can be given for any one picture.

The standard of this award must be 35 marks out of a possible 50.

Rules Governing the Judges in Class A.

The points to be considered are: 1st, Originality; 2d, Composition; 3d, Lighting; 4th, Technique.

Ten marks to be the highest for any one point, consequently 40 marks the most that can be given to any one picture.

Rules Governing the Judges in Other Classes.

The points to be considered are: 1st, Lighting; 2d, Posing; 3d, Chemical Effect; 4th, General Effects or Finish.

All photographs exhibited must be from negatives made since the 11th Annual Convention, held at Washington, D. C., August, 1890.

All art exhibits must be sent to S. L. Stein, Art Department, Photographers' Association of America, care of Buffalo Park Association, Buffalo, N. Y., all charges prepaid.

Exhibits for the stock department to be shipped in care of W. A. Davis, Secretary, Photographers' Association of America, care of Buffalo Park Association, Buffalo, N. Y., and placed in position by 10 A.M., July 14th, all charges prepaid.

The art and stock department will be closed each day from 10 o'clock A.M. to 12 o'clock M., to secure a large attendance at the business meetings.

As will be seen from above notes, there has been a very liberal classification of art productions and awards for same, and it is hoped and expected that there will be a ready response, so that long before the Convention opens, knowledge of what is to come will enable the officers to be fully prepared for all entries, that each one may be properly classified and hung.

I would request all exhibitors to send with their work screw-eyes and cord, so that the Committee may not be put to trouble and expense, as it is the plan to have all exhibits hung before the opening of the Convention, thereby saving noise and time, and having all members in attendance at the business sessions. It is very natural for all to postpone sending exhibits until within a few days of the opening of the Exhibition; but arrangements will be made at the railroad stations in Buffalo to hold anything sent until the proper time to send them to the hall, so that no one need feel any uncertainty about the safety or disposition of the same.

Have your box covers screwed instead of nailed; put your home address on under side of box cover for return of pictures; help your committee all you can by promptly forwarding entries and exhibits. There is enough for them to do, even if these rules and suggestions are fully carried out.

The Executive Committee are very desirous of having this Convention the best ever held, and earnestly request that every one will make an extra effort to have a finer display of artistic photographs than has been exhibited in the past.

W. A. Davis,
Secretary.

OUR TWO ILLUSTRATIONS.

With this issue of the Bulletin we again present our readers with two examples of artistic photography. During the winter months it is very difficult to get the large number of silver prints that are needed for the illustrations of the Bulletin. But with such workers as Mr. Conly, of Boston, all things seem possible, and the handsome frontispiece that adorns this issue of the journal shows better than any words of ours what a good worker can do under adverse circumstances. As usual, the skill of the artist is well brought out, and every point that makes a photograph worth looking at has not been neglected on account of a few difficulties presented by the weather. Mr. C. F. Conly is too proud of his reputation to let the elements become an excuse for any carelessness in his productions.

The extra illustration is a photogravure from a picture by Mlle. C. Fould, and will serve as a good example of genre study for those interested in that phase of photographic work. The action in the picture is very life-like, and contains many points worthy of consideration in the way of posing and lighting.

NEGATIVE BOXES FOR TRANSPORTATION.

To the Editors of the Bulletin :

In a late number of the *Scientific American* I saw a note regarding a newly-invented negative box, wherein, in place of the regulation corrugated wooden sides, the party had inserted rubber strips, thus making a box in which negatives could readily be sent by express or freight with much less liability of fracture. In 1867 there were several of such negative boxes lying around our store, which had been received from Europe filled with transparent stereo views on glass, and it was then proposed to make up a lot, but the high cost of rubber at that time proved too serious an obstacle. It was doubted if any one would buy them at the necessarily high cost in proportion to the regular article. They not only had rubber separations at the sides, but also strips on inner side of cover, to press on the upper edges of the plates when the box was closed, preventing any motion to the contents during transportation and insuring their safe carriage.

In old wet-plate days it was very desirable, when photographing a long way from home, to develop the negative, and then stop the action by a strong solution of acetic acid No 8 in glycerine, which would allow the plates to be stored in boxes, carried home and finished at leisure. For this purpose negative boxes were made entirely of tin, with rubber strips on bottom of box and inner side of cover for safely carrying the unfinished negatives. Plates thus prepared, that were exposed and developed in the South Pacific, were finished in our building months afterwards.

Yours truly,

E. B. Barker,

With E. & H. T. Anthony & Co.

"It's a great pity," said the typo, "that the copyright bill didn't pass through Congress."

"Why, what difference does it make to you?"

Typo: "Well, I'd like to see all authors, and more particularly editors and reporters, get their copy right. As it is, sometimes, it's a terror of the worst kind."

ANTHONY'S
Photographic Bulletin.

EDITED BY

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Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.

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COLLOTYPE FOR AMATEURS.

At a recent meeting of the London and Provincial Photographic Association, a demonstration was given by Mr. L. Warnerke on "Collography." The lecturer expressed his opinion that a wide future is open for photo-mechanical printing. There was a general belief that special appliances were necessary, and that generally all processes of this kind were troublesome to work. The demand for cheapness and quickness of production had proved detrimental to good work. The process he intended to demonstrate was simple, requiring no special apparatus of any kind, enabling amateurs to produce quickly an unlimited number of copies on ordinary paper, with printer's ink, from photographic negatives. For the purposes of demonstration the lecturer had brought with him several sheets of exposed films in various stages. He proceeded to describe the process. A sheet of vegetable parchment, having a film of gelatine on its surface, is immersed for three minutes in a bath of bichromate of potash neutralized with ammonia. The sheet is then squeegeed to a glass plate that has previously been cleaned and polished with French chalk. The plate is now left to dry spontaneously. The drying should be completed in about ten hours, when the film will peel off its support. The maximum of sensitiveness would be reached in from two to three days after sensitizing. The object of drying the sheets on glass is to produce a flat surface, thus giving perfectly even contact with the negative. The sensitized film is exposed in an ordinary printing-frame. When sufficiently exposed, the image will be quite visible. An exposure of the back of the film for two or three minutes to diffused light will cement it to the parchment support. The exposed tissue is now placed in water, and allowed to remain about two hours until quite colorless; it is then drained and blotted, and the following solution poured over it:

Glycerine	70	parts
Ammonia	3	"
Water	30	"

After soaking for an hour, the tissue is stretched upon a frame over a block of wood, and rolled up with printer's ink. For this purpose, the lecturer recommended using first a stiff ink, and afterwards a thinner kind. Authorities differed with regard to the materials for thinning the ink. The lecturer said he preferred lard for this purpose. Sufficient rolling having been given to the surface of swelled gelatine, a sheet of paper is placed on it, and an impression can be taken in an ordinary letter-copying press. Mr. L. Warnerke, at the conclusion of the demonstration, pulled several proofs from a sheet of prepared tissue, and passed them round. In answer to several questions Mr. Warnerke said he was unable to state the limit of the number of impressions that could be taken from one sheet; he had taken as many as 300 himself. Any paper might be used. It was necessary in printing to lay strips of paper round the inked image to protect the sides of the sheet of paper receiving the impression.

First French Maid: "Little Harry seems to be very fond of you, Julia."

Second French Maid: "Yes, the dear little boy! He takes after his father."

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A stated meeting of the society was held Wednesday evening, January 14, 1891, the President, Mr. John G. Bullock, in the chair.

The Board of Directors reported that they had met for organization on December 15, 1890, and their prospective duties had been divided among the following standing committees: House Committee—Joseph H. Burroughs, George M. Taylor, John G. Bullock; Committee on Meetings—Charles L. Mitchell, M.D., Robert S. Redfield, Edmund Stirling; Committee on Library and Publications—John C. Browne, George Vaux, Jr., Herbert M. Howe, M.D.; Committee on Lantern Slides—William H. Rau, Edmund Stirling, John Carbutt; Committee on Membership—Samuel Sartain, Joseph H. Burroughs, Samuel M. Fox.

The first Thursday afternoon of each month, at 4 o'clock, had been fixed as the time for holding the regular monthly meetings of the Board. By authority of the Board the Committee on Meetings had engaged the lecture-room of the Franklin Institute for one evening each month for the balance of the season, for the purpose of holding exhibitions of lantern slides before members and their friends. The first of these exhibitions was given on Thursday evening, January 8th, by Dr. Charles L. Mitchell, illustrating "Southern Germany and the Tyrol." About 150 slides were shown to a large and appreciative audience. At the Board meeting, January 3d, Mr. J. Somers Smith, Jr., was elected an active member. It was also announced that a public exhibition of lantern slides, representing the work of members, would be given on the evening of Friday, February 20th, at Association Hall.

By recommendation of the Board of Directors, and on motion of Mr. Cheyney, Mr. John Sartain was transferred from active to honorary membership.

On motion of Dr. Mitchell, Mr. William H. Rau was nominated and subsequently elected to represent the society as a Director of the American Lantern Slide Interchange for the season of 1891 and 1892.

The paper for the evening was read by Mr. Frederic E. Ives, being an abstract of his recent lecture delivered before the Franklin Institute on "Heliochromy, or Photography in the Colors of Nature" (see *Journal of the Franklin Institute*, January, 1891). Four permanent color-print heliochromes by his patented process were shown. He also repeated a suggestion which he made, incidentally, in his lecture at the Franklin Institute, and which was not published because the lecture was in print when the suggestion was made. After speaking of the insensitiveness of the old chloride of silver process, which is suitable only for printing-out under-colored glasses and similar copy, he said he believed a far better printing-out process could be devised, employing fugitive dyes, which, as is well known, are bleached by the light rays which they absorb. He said. "Suppose we take for this purpose three very fugitive dyes, a green-blue, a magenta and a yellow. Every part of the spectrum can be represented by means of films more or less deeply stained with these dyes, separate or superimposed upon a white surface; and if the three fully colored films are superimposed together, we get a good black. Project the solar spectrum upon this compound film, and what will it do? Sooner or later, depending upon the light-sensitiveness of the dyes, the red rays will bleach the green-blue dye, which is the only one that absorbs those rays, and leave the yellow and magenta unaltered, making a full red. The yellow rays, which are absorbed by the magenta and the green-blue dyes, will bleach them both, leaving only the yellow. The green rays, which are absorbed only by the magenta dye, will bleach it and leave the yellow and green-blue dyes unaltered, making a full green. The blue rays, which are absorbed only by the yellow dye, will bleach it, leaving the green-blue and magenta dyes unaltered, making a full blue. Other parts of the spectrum, acting upon the same principle, will give intermediate tints, by only partly bleaching the dyes which they do not completely absorb; and white light will bleach all the dyes, exposing the white support. It might be possible to mix the dyes so as to apply them together in a single film, as of collodion or gelatine. Should the light-sensitiveness of the dyes be unequal, evenness of action could be secured by the use of light-filters, as in orthochromatic photography. The process might be named "heliochromography." Turmeric exactly fulfills the requirements for a fugitive yellow dye, printing-out completely in a few minutes in bright sunlight. It will be only necessary to find equally fugitive dyes of the right shades of green-blue and magenta-red in order to obtain direct color prints far brighter and truer than the best that have been made on the silver-chloride plates. Cyanine, which prints-out as quick as turmeric, makes pictures that can be rendered permanent, but it is not exactly the right shade of blue to carry out the process with only three dyes. There are many coal-tar dyes so fugitive that they have no commercial value, and are not manu-

factured; among these it is quite likely that suitable dyes for carrying out the process may be found. Should it ever be found possible to continue, by chemical agency, the process started in the dyes by the light-rays themselves, the picture could then be made in the camera, and if all the colors could be fixed, like cyanine, when sufficiently reduced, permanent photography in the natural colors would then be within the reach of every amateur. Meanwhile, we shall probably have to content ourselves with the more round-about but no less scientific and capable method of composite heliochromy."

On motion of Mr. Rosengarten, the society expressed its hearty appreciation of the great work Mr. Ives had accomplished, and tendered him a vote of thanks for his very interesting and valuable communication.

Mr. Browne said he would like to ask Mr. Ives one question. Some time about 1862 or 1863 he remembered seeing a daguerreotype plate sent from France, and which M. Becquerel claimed to have been made in the camera. It represented a Scotch plaid or shawl. The picture originally had very bright colors, but was then considerably faded. It was sent here as a very great curiosity, and was shown to some of the members of the Franklin Institute. Did Mr. Ives remember what process that was?

Mr. Ives said it was the same old chloride of silver process, of which they had an illustration now on the President's table. It was considerably brighter than the pictures he had shown them, but it was substantially the same process, and was obtained by two days' exposure in the sunlight, using a portrait lens. A two days' exposure in the sunlight was, of course, entirely impracticable, no matter what the result might be. A method of fixing these pictures permanently had not yet been found; they had to be kept from light.

Mr. Earle showed and described a rubber-type outfit for printing titles, numbers, etc., on negatives. The novel feature was the fact that the type were positive instead of negative, as usual with type. As a consequence, they printed on the film of the negative in *negative letters*, and when so used a print from the negative showed the letters as *positive*, so that they could be read properly on the positive print. The type were easily set up, and could be read and corrected in the holder before any printing was done. It was small enough to be adapted to small prints or lantern slides, and did not detract from the appearance of a picture when thrown on the screen, and that was one of its most important uses.

Mr. Stirling, for the Committee on Meetings, reported the result of the votes cast to select the four "honor pictures" for 1890 from the collection of pictures contributed by members, which had been on exhibition since the December meeting. The pictures chosen were: No. 147, "A Swiss Valley," by Dr. Charles L. Mitchell; No. 133, "Mending Their Ways," by Robert S. Redfield; No. 185, "Westward as Far as the Eye Can Reach," by John G. Bullock; No. 131, "Flo," by Clarence B. Moore.

The meeting closed with an exhibition of lantern slides by Mr. A. M. Spangler, a visitor, representing a large number of views in the Yellowstone Park, etc. Many of the slides were colored to show the vivid hues of the rocks and geyser formations in that wonderful region, which added greatly to the interest of the collection. Adjourned.

ROBERT S. REDFIELD,
Secretary.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE room of the section was crowded on Tuesday evening, February 3d, it having been announced that Professor D. L. Elmendorf would give a talk on "Two Weeks in Holland," and would illustrate the same by lantern slides from negatives taken by him during his trip.

The meeting was called to order by Mr. H. J. Newton at 8.15. The Secretary acknowledged the receipt of a bound copy of Anthony's BULLETIN for 1890, and a letter from the publishers hoping that the same would be found an acceptable addition to the library. The *Photographic Times*, *The Eye* and other periodicals had been received, and the Secretary was instructed to record a vote of thanks to all who had so kindly contributed photographic literature.

The Polytechnic Section of the Institute extended an invitation to all to their meetings, which take place on the third Thursday of every month. On February 19th a musical evening is promised, Professor Spice, of Brooklyn, being the entertainer.

President Henry J. Newton said it afforded him great pleasure to introduce Professor Elmendorf.

The Professor then gave a chatty descriptive outline of his trip, from his leaving New York

on a Dutch steamer to his return. Several amusing bits on board the vessel were shown, after which the audience were carried to the Bishop Rock Light-house, the Lizards, and thence to Holland. Most of the views here shown were colored remarkably well, greatly enhancing the effect on the screen. Starting from Rotterdam, the trip was extended through Delft, La Hague, Schevenengen, Leider, Haarlem, Amsterdam, Helder, Alkmaar, Hoorn and Enkhuizen. This includes the old portion of Holland, the old streets, with the toppling houses and public buildings, the canals and dykes, curious boats, quaint inhabitants and peculiar customs, being demonstrated to perfection. Holland seems to be a country where admirable food for the camera may be obtained at every step, and the selection exhibited made the audience long for more.

A hearty ovation greeted the Professor at the close of his interesting talk, and a vote of thanks was carried in a manner which must have shown him that his audience had been with him from beginning to end.

It was announced that at the next meeting, on March 3d, Dr. J. W. Bartlett would give a similar talk on his travels through Europe.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—O. La R. writes: Enclosed please find some kind of a specimen found in this vicinity and on top of the ground in large pieces. As you see, it can be separated like isinglass into very thin layers; yet it will not stand much heat. Please tell me through the columns of the BULLETIN if it is of any value.

A.—The specimen sent is a very clear variety of gypsum or sulphate of lime, sometimes called selenite. It is of no value in photography; but in large pieces is useful for making objects to be used with polarized light in the microscope, giving a very beautiful display of colors.

Q.—G. J. S. writes: Please give me, through the columns of the BULLETIN, a formula for toning silver prints of a brown color, something like the very fine picture in the BULLETIN of January 10th. Should the print, previous to toning, be immersed in water containing salt, ammonia or acetic acid? Tell me which, and how much to use, also how long the prints should remain in this water? Can you also give a formula for a good retouching surface to be used on the negative without varnish?

A.—We cannot give the formula used in the toning of the prints used in the BULLETIN mentioned, but good brown tones are obtained by putting into the wash water a little common salt, say half a teaspoonful in a pint of water, and then use a toning bath with acetate of soda in it. A good bath is made as follows:

Gold chloride	1 grain.
Sodium acetate	30 grains.
Water	10 ounces.

If this bath tones too brown add to it a little sodium bicarbonate to make it just alkaline to test paper. The time that the prints should remain in the wash water must be determined by experience, but about ten or fifteen minutes is a good average. In regard to the matter of retouching, the surface of the gelatine film may be roughened with some pumice powder applied dry, care being taken that the film also is perfectly dry and the powder free from grit.

Q.—R. A. writes: Will you kindly inform me of the best way to flatten out unmounted prints which have been rolled up a long time?

A.—Moisten the backs of the prints with water containing about 2 per cent. of glycerine, and place them between sheets of glass until flat, after which they will remain so.

Q.—O. C. writes: Will you tell me in the next issue of the BULLETIN the process for making photographs on china so that they can be burnt in? Or, if you think the process too long to give in the BULLETIN, tell me where I can obtain the information.

A.—We do not know any book in the English language that contains the information that you desire. There are several books published in French; one of these has the title, "Traité Practique de Ceramique Photographique," par Gymet, and is published by Gauthier-Villars & Fils, Paris. The platinum process can be used for the same purpose by transferring to the objects and then coating with a glaze which is burnt in.

Q.—J. W. L. writes: Please tell me what is good to preserve the Clements' platinotype paper; that is, the name of the material to put in the box?

A.—The paper must be kept perfectly dry, and the substance used is calcium chloride in a fused state, and broken into lumps. Quicklime may also be used for the same purpose.

Q.—A. E. F. writes: Will you tell me the reason why pictures taken with the Harvard plates are reddish or brown and not like the black color of other plates?

A.—The plates have nothing to do with the brown color; it is most probably due to the dark-colored developer used. To get rid of this color place the plates after development in a bath containing a little acid sulphite of soda, washing the plates before immersion.

Views Caught with the Drop Shutter.

The Photographic Times send us their handsome calendar for 1891. It is a fine piece of lithographic work, representing old colonial life in New York, surrounding the very convenient dial form of calendar for each month. We tender our best thanks for the kind remembrance.

W. H. Walmsley, Limited, of Philadelphia, send us the second edition of their catalogue of cameras and lenses. It is a neat and handy list, and contains all the novelties offered by that well-known firm. They also send a classified list of photo-micrographs and lantern slides made from negatives taken by Mr. Walmsley, whose skill in this kind of work is world-renowned. Those of our readers who are interested in this phase of photographic work should send for this list. We have also received a package of "Graphol" developer from the same firm, and tender our best thanks for the same. It appears to work nicely.

We note from Minneapolis papers that the lawsuit against the photographer A. B. Rugg, of that city, has been dismissed on motion of the plaintiff's lawyer. It will be remembered that this case was for damages for selling the photographs of a Mrs. Moore without her consent. The ruling of the Supreme Court was that only nominal damages could be collected in any case, and this is probably the reason it was dismissed.

Charles D. Kirkland, of Cheyenne, has invented a new emulsion for photographic prints that is causing quite a surprise in that city. It appears to be a kind of aristotype paper, from the description sent to us.

C. S. Roshon, of Lebanon, Pa., is one of the enterprising men of that town, and a photographer whose work is being appreciated. He has just completed the erection of a printing-room where he can turn out 8,000 to 10,000 cabinet pictures per week, about twice his former output.

Horgan, Robey & Co., of Boston, are the new firm that succeed C. H. Codman & Co.; and Mr. John Stalker is a junior partner in the new concern.

We are indebted to the publishers of *The Photographic Times* for a handsomely bound copy of the last volume of their journal. It will find a good place in our library, and we tender our best thanks for the kindness of the donors.

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Evening Post Job Print, N. Y.

NEGATIVE BY W. J. HICKMOTT
HARTFORD, CONN.

HELIOTYPE PRINTING CO.
BOSTON, MASS.

HELLO!!

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

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THE COMING CONVENTION AT BUFFALO.

As we were going to press with the last number of the BULLETIN we received the programme of the prizes to be awarded at the twelfth annual convention of the Photographers' Association of America. When we look at the provisions made for the competition for prizes we see that the officers for the present year are men who are wide awake to the interest of the photographic art and its progress. It seems to us that the liberal distribution of the awards, so as to give every kind of work a chance to be recognized, is all that any fair-minded competitor could desire. From our knowledge of the men who have these matters in charge, the prizes will be well worthy of the struggle to all who have the courage to enter the contest. The grand prize, worth $175, a handsome bronze group, will be a trophy worthy of the highest efforts of the best workers in our art. By selecting the beautiful poem of "Elaine" the officers of the association have given an opportunity for some fine poetic treatment that should call forth extraordinary results from a large number of competitors. We sincerely hope that every photographer that takes any interest in his art will send pictures to take part in this great trial of skill. It is not of so much importance that the prize is won or lost, but it is of great importance that the effort has been made to excel in the art. Every competitor in any trial of skill is always better for having made an effort, even if he fail to gain a material reward; the fact of having done the work will teach him far more than he can now realize.

But all those who are working at photography may not be in a position to aspire to the grand prize; for these other inducements in the form of valuable trophies are offered which are also worthy of the best efforts. The prize for genre studies is a work of art that will prove a stimulus to all those who love this kind of photographic work, and we feel sure will bring out some excellent results at the coming convention. Medals for portraits of various sizes, consisting of two gold, two silver and two bronze medals, should bring out a large exhibit in these departments, and give a large chance for a prize to those skilled in this phase of photographic art.

In landscape photography there is a capital chance for some fine work, after

the manner of H. P. Robinson in the special class of landscapes with figures, for which a gold medal is offered. In the class of landscapes without figures one silver and one bronze medal is offered. Marine views and architectural views are each to be rewarded with a silver medal; while enlargements in silver, on bromide paper, in carbon, and on platinum paper will have a chance to compete for one silver and one bronze medal.

Another and a very important class is that assigned to photographers' assistants. Indeed, there are three classes devoted to work done by these too-often-forgotten but very important members of the fraternity. And we are very glad that a step to recognize their work has been taken by the men in charge of the Buffalo convention. In the three classes we have mentioned a gold medal is to be awarded to the best three artistic photographs, a silver medal to the best six retouched negatives, and a bronze medal to the best six examples of artistic printing. This chance of obtaining a reward for skill in photographic work should be eagerly seized by many assistants, as it will be a kind of diploma for them to be used in obtaining positions, a valuable stamp of the approval of their work by the foremost photographers of America.

All the details of the rules, and the time of closing of the entries, were given in the last issue of the BULLETIN; it is therefore unnecessary to repeat them again here.

Every provision has been made by the officers of the association to insure a successful convention. The place of meeting will be the Buffalo Park Association at Buffalo, N. Y., and the time July 14th, 15th, 16th and 17th. The accommodations provided are of the most ample character, consisting of a regular art gallery for the display of the pictures, and having a good arrangement for the lighting; the manufacturers' department will also have a fine hall for the display of apparatus and other materials.

In addition to these a large hall will be available for the business and other meetings of the association.

Before closing we would like to say a word to those who may think of competing for the grand prize. Above all things study the poem that you are going to illustrate, and do not try to follow or imitate the pictures that are to be found in cheap editions of Tennyson's poems. These pictures are often entirely misleading, owing to the fact that the plates from which they were printed served as illustrations to a totally different volume. Spend an evening in some good public library and consult the best editions of the poems. A cheap volume of the poems will answer every purpose as far as getting the thoughts of the poet is concerned, and one that can be put into the coat pocket as a constant companion will make study of the subject least irksome and probably a delight.

Do not forget that time flies, and July will be here before you are aware of it; therefore begin thinking about the matter at once.

EDITORIAL NOTES.

IT is said that M. Lippmann, of Paris, Professor of Physics at the Sorbonne, has succeeded in photographing the colors of the spectrum in all their natural brilliancy and intensity, the greens, blues and yellows appearing as perfectly as in the original. We wait with interest to learn more of his achievements in this direction.

A NEW amateur society has just been started in San Francisco, under the name of the "Snap Shot Camera Club," which is composed of members under sixteen years of age principally, but who expect soon to have club-rooms and accessories equal to any. Their *President* is Horace Morsan ; *Vice-President*, Paul Weil ; *Secretary*, Hugo Klauber; and *Treasurer*, J. Baird. Success to them.

THE second annual exhibition of pictures by the New York Camera Club will take place at the rooms of the club, 314 Fifth avenue, from March 4th to 21st, both inclusive ; the indications all point to a brilliant and successful exhibition.

AN interesting process of re-development for the purpose of obtaining brown and reddish tones in bromide prints is published by Dr. Stolze, of Germany. He uses for the first development :

SOLUTION NO. 1.

Sodium sulphite	10 parts.
Eikonogen	2 "
Distilled water	150 "

SOLUTION NO. 2.

Carbonate of potash	25 parts.
Distilled water	150 "

For normal negatives mix 25 parts of No. 1 with 10 parts of No. 2, and from 75 to 90 parts distilled water. For over-timed negatives more, and for under-timed negatives less of No. 1 is used. The temperature should be about 60 degrees Fahr. In full exposures, bromide of potassium should be added—this treatment produces beautiful tones of a slightly yellowish-brown color, to change which into brown or reddish color, it is necessary to transform the image into bromide of silver and re-develop as follows :

SOLUTION A.

Sulphate of copper	1 part.
Distilled water	100 parts.

SOLUTION B.

Potassium bromide	1 part.
Distilled water	100 parts.

These two solutions are mixed and the print bleached therein, after which they are thoroughly washed to eliminate as much as possible the copper, and treated with the eikonogen developer first used, in the following proportion :

Solution No. 1	50 parts.
" " 2	20 "
Diluted water	4930 "

The prints will undergo all the changes of tone from vivid red chalk to deep violet black, and may be stopped at any desired tone by immersing in a bath of citric acid, 1 to 100 of water, after which they should be washed and dried.

The intensity and detail obtainable depend largely on the second development, which brings out much more than is apparent after the first, and the process is therefore highly commended as an intensifying agent, both for bromide and for negatives as well.

THE annual meeting of the Camera Club of Hartford took place recently, and resulted in evincing a decided activity and interest in club work. The fourth public exhibition of the club, just closed, was most successful and very largely attended. The club membership was shown to have increased 77 per cent. during the year. The following officers were elected for the ensuing year: *President*, Dr. Geo. L. Parmelee; *Secretary*, Chas. R. Nason; *Corresponding Secretary*, Edward H. Crowell; *Treasurer*, Frederic D. Berry.

A DEVELOPER recently mentioned by Mr. Putz, as being identical in its results with the French crystallos, has been analyzed by an able chemist and found to be composed of the following ingredients:

Hydroquinone	9 parts.
Sulphite sodium	30 "
Ferrocyanide of potassium	5 "
Caustic soda	20 "
Water	200 "

The coloring substance used has no value as a developing agent.

THE Camera Club of the Hartford Public High School announces an exhibition on the 28th instant, and names prizes for various classes of work; and thus photography is gradually creeping into our educational system.

PROF. ROWLAND, of Johns Hopkins University, is making very satisfactory progress in his experiments toward photographing the spectra of the elements and the identification of the lines in the solar spectrum. He has demonstrated that yttrium is separated into three components and two actual divisions. The paper issued by him in the University Circular is of great interest.

AGAIN Boston comes to the front. This time it is her camera club that has distinguished itself by opening its doors to ladies and inviting them to become members. This is an example, like many others which the "Hub" has set, that may be well followed by other clubs and associations.

THE Buffalo Camera Club gave a most enjoyable exhibition of slides on the 7th instant, showing a number of slides from the Pacific Coast Amateur Photographic Association, as well as many made by its own members.

AN invention of considerable value to photo-engravers and others copying line and wash work, where several cameras are constantly kept busy, consists in an automatic shutter which opens and closes the lens, and which gives an exposure of any required length, which is regulated by the adjustment of the hands of a dial, thus saving the time of the operator in manipulating each camera separately and waiting for the exposure to be completed before making another.

OUR eminent friend, Mr. Van der Weyde, of London, has recently effected a wonderfully realistic piece of work in the line of imitating, for dramatic purposes, a large group of statuary, the modeling and lighting of which are said to be so perfect as to prove almost indistinguishable from marble itself. The undertaking is certainly a bold one, and we know of no one more likely to succeed with it than Mr. Van der Weyde.

A VIGOROUS onslaught is being made by the Road Improvement Committee of the League of American Wheelmen on the bad roads that abound in some parts of our country, and they now offer three prizes, amounting to $100 in gold, for photographs of such bad roads. Competition is open to all, and full particulars may be obtained of Mr. Isaac B. Potter, 278 Potter Building, New York. Entries close on the 1st of May.

THE annual meeting of the Schenectady Camera Club was held on the 5th instant, and the following officers were elected: *President*, William C. Vrooman; *First Vice-President*, William H. Peckham; *Second Vice-President*, J. L. Carnall; *Secretary* and *Treasurer*, W. E. Underhill. An address by Mr. A. H. Atwood, on Photographic Printing, was a feature of the evening.

OUR good friend C. F. Conly, of Boston, photographed the audience of the Park Theater in that city recently, by flash light, and obtained, we understand, a very successful negative. The picture will probably be used as the basis of a souvenir, later on.

A VERY interesting meeting of the Pacific Coast Amateur Photographic Society was held on the 5th, and an exhibition of prints and slides decided upon, to take place later in the season.

THE annual reception of the Amateur Photographic Society of Pittsburgh was held at the Academy of Science and Art in that city, and was largely attended. The exhibition of work by members of the club was large and of more than usual merit, eliciting much praise from those who attended. Prizes were awarded in several classes.

AN English manufacturing firm in the lace business employ a photographer constantly to photograph wood scenes where ferns abound. These views are utilized by their artists as the bases of new designs in lace and embroideries.

THE Society of Amateur Photographers of New York announce an exhibition of prints, negatives, transparencies and lantern slides, at the Ortgies Gallery, in this city, on the 25th of May.

FOR removing the yellow stain of hydroquinone from a negative, M. Imbault recommends immersion in

Potassium ferricyanide	1 grain.
Distilled water	200 c.c.

and after it is stainless, washing and fixing in the usual hypo bath.

M. de Villecholle claims that the same result may be obtained by a fixing bath as follows:

Hyposulphite of soda	20 grains.
Sodium bisulphite	5 "
Water	100 c.c.

In our own experience, the acid sulphite of soda, prepared by the publishers of the BULLETIN, added to the ordinary hypo bath, has been found to work

beautifully and with certainty, not only cleansing but imparting a fine color to the negatives so treated.

PRIZES were awarded at the recent meeting of the Hoboken Camera Club to Messrs. William Allen, F. A. Muench, Alexander Beckers and George H. Steljes, for the best work in the several classes.

THE Manhattan Chapter of the Agassiz Association of New York will hold a photographic exhibition at 139 East 40th street, on March 4th, 5th and 6th, from 3 to 10 P.M.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

What is Crystallos?—New Rapid Developers of Eder and Lainer.—Influence of Cold on Development.—Danger of Blitz-pulver.—New Flash Light.—Dr. Koch, Photography and Bactereology.—Photography of Luminous Bacteria.

WHAT is the latest novelty? Crystallos! What is crystallos? A new and powerful developer, sold in Paris as a secret.

Perhaps this secret has already reached America. I will tell you now what it is: It is no new body, but a compound of hydroquinone, yellow prussiate of potassium, eikonogen, sulphite of sodium and caustic potash. Eder and Lainer have proven already that the crystallos can easily be made by everybody, and give the following prescriptions, which are all rapid acting developers:

FORMULA I.—SOLUTION A.

Sulphite of soda	40 grms.
Yellow prussiate of potassium	120 "
Hydroquinone	10 "
Water	900 c.c.

The Solution B remains the same, caustic potash 1.2. For use mix, per cabinet size plate:

A (Formula II)	60 c.c.
B (Formula I)	6 c.c.

The picture appears in about three seconds, and the development is finished in thirty to forty-five seconds, but the fifth row of the sensitometer plate shows a strength, as frequently seen only in the fourth row; the number 25 was still recognizable with certainty; the fourth row had a surprising strength, and the first numbers showed a very great density, without being opaque at the same time; the gradation could be designated a very good one.*

This developer excels by allowing a shortening of the time of exposure, by magnificently drawing the details in the shadows and admitting a very rapid development.

Over-exposed plates, of course, dare not be touched with a rapid developer. If the caustic potash was added in larger quantity in Formula I, the density of the negative would be reduced at equal duration of development; reduction of the hydroquinone and increase of the sulphite of soda will act similarly, which defines the manner of action of these compounds.

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* If the development is extended too much, the first row will appear covered very forcibly.

A very good formula is also obtained with reduced addition of the ferrocyanide of potassium, and by application of caustic soda in place of the caustic potash.

FORMULA II.—SOLUTION A.

Sulphite of soda	30 gr.
Ferrocyanide of potassium	90 "
Hydroquinone	10 "
Water	950 c.c.m.

SOLUTION B.

Caustic soda	30 gr.
Water	90 c.c.m.

If 60 c.c. A and 6 c.c. B (KOH 1.2) are mixed, similar results will be obtained as with Formula I ; but if

A (Formula I)	60 c.c.
B (Caustic soda 1.3)	12 "

are mixed, we will have a modification of the rapid hydroquinone developer, which will give the negatives a softer character, and will act very fine with many styles of plates, preserving full clearness of the negatives.

The following formula works a little slower :

FORMULA III.—SOLUTION A.

Sulphite soda	35 grms.
Ferrocyanide of potassium	25 "
Hydroquinone	10 "
Water	1,000 c.c.

Mix per cabinet size plates :

A (Formula II)	60 c.c.
B (Caustic potash 1.2)	6–9 "

or

A (Formula II)	60 c.c.
B′ (Caustic soda 1.3)	10–12 "

It takes five seconds for the picture to appear, and in one to two minutes it is ready developed. The gradation is very good. The plates remain likewise clear in the developer, and portraits, taken even on foggy and dark days, give excellent results ; particularly favorable was—no comparison with the pyro-soda developer and aside from the quick time of development of one to one and a half minutes—the delineation of the shadows, as also the strength of the negative, which, with the pyro developer at equal duration of exposure and longer development, was not obtained after two to three minutes.

All these developers can be handled very conveniently. In the morning the quantity for the whole day or for several days is mixed. The mixture will keep very well in corked bottles, and I could see no decomposition after eight days.

If it is desirable to prepare the mixture before use in equal volumes, the formulas can easily be calculated accordingly, for instance, Formula III in Formula IV.

FORMULA IV.—SOLUTION A.

Sulphite soda	35 grms.
Yellow prussiate potassium	25 "
Hydroquinone	10 "
Water	550 c.c.

Solution B.

Caustic potass	50 grms.
Water	550 c.c.

or

Solution B'.

Caustic soda	60 grms.
Water	550 c.c.

Mix per cabinet size plate :

A (Formula III)	30 c.c.
B or B'	30 "

For tourists it is recommended to have the developer always concentrated.

Formula for a Concentrated Rapid Hydroquinone Developer.

A.—Dissolve 25–30 grms. sulphite soda in 100 c.c. water and then 10 grms. hydroquinone warm, further 25 grms. yellow prussiate potash, likewise in 100 c.c. water. Both solutions are mixed and give 200 c.c.

B.—50 grms. caustic potash are dissolved in 100 c.c. water, or 30 grms. caustic soda in 90 c.c. water.

Talking about developer, it may not be out of place to make some remarks at the same time about the effect of cold upon the development.

According to the *British Journal of Photography* the hydroquinone developer is particularly sensitive to cold.

Dr. Miethe confirms this, and remarks that the said developer loses its developing power entirely at 41 degrees Fahr. Less affected are pyrogallic acid, iron, and the least affected eikonogen. The former develop harder in the cold, eikonogen weaker and softer ; good contrasts and strength are obtained with the latter only when warm.

The danger of the Blitz-pulver has oftentimes been pointed out. Dr. Kemisch in Breslau has made some experiments about the same.

He has tested the Blitz-licht pulver, consisting of perchlorate of potassium 60 per cent. and powdered magnesium 40 per cent., invented almost simultaneously by Professor Dr. Max Müller in Brunswick, and Dr. Rohmann and Dr. Galnosky in Breslau, upon its combustibility, and has come to the result that shock, blow, stroke and other concussions as well as lasting temperatures of 45 degrees C. will not effect the explosion. It appears therefore that it can be carried by tourists without any danger. The same applies to the Zünd powder used by Rohmann and Galnosky, which consists of 2 parts chlorate of potassium and 1 part sugar of milk. The very recommendable combination of this Zünd (inflammable) powder with the before-mentioned Blitz-licht pulver (flash-light powder), which furnishes a very short and intense action of light, is to be designated as Rohmann and Galnosky's Blitz-licht. It can even be set off on a coal-shovel with a match, therefore without any complicated apparatus.

By the great discoveries of our Professor Dr. Koch, who has applied photography for the last ten years in his bacteria researches, thus facilitating greatly his microscopic labors and obtaining pictures which are much more faithful and correct than the best drawings, the photographic bacteria researches have come more and more to an honorable reputation. An entirely new bactereological institution with photographic studio is being erected for Dr. Koch.

The number of scientific micro-photographers increases from day to day.

All our opticians are fully occupied with orders for microscopes for this purpose. In short, an entirely new branch of photography is being developed, but which, of course, can only be pursued by scientists.

The latest result of these researches is the photography of luminous bacteriæ by Dr. Fischer in Breslau.

Dead salt-water animals (fishes, crabs, etc.), show sometimes the phenomena of phosphorescence; that is, they are luminous in the dark. They emit a bluish-white, sometimes grayish light, which can be so intense that print can be read near by. The light issues from a bacteria settlement on the surface of the dead animal, which leads to the formation of a gray-white, also gray-yellow slimy coating, luminous in the dark.

Every salt-water fish, freshly caught, will show the phosphorescence, if kept in a cool place and protected from evaporation, within eight to forty-eight hours. By transferring some of the luminous slime upon other dead fishes, crabs, etc., the phenomena of this phosphorescence can be produced artificially; the meat of our domestic animals becomes in a similar manner self-luminous by inoculation. Lately the discovery has been made that living crabs become self-luminous by the inoculation of such luminous slime; their body is gradually impregnated by the light-developing bacteriæ, and they die within a week of the so-called "luminous sickness." For the artificial breeding of the luminous bacteriæ Fischer applies a fish bouillon mixed with gelatine. The bouillon is obtained by boiling the chopped meat of fresh herrings in sea-water. By means of this nourishing gelatine the luminous bacteriæ found upon sea fishes, etc., can be obtained and bred for any length of time. Such light-developing bacteriæ can also be found in the sea-water. Fischer has bred so far seven different kinds therefrom. From a species of bacteriæ brought from the West Indies in 1887, and from a species bred last year in the North Sea, pure specimens were shown. If some of this luminous matter of the North Sea is transferred upon a cooked herring the same will become luminous on its surface within forty-eight hours. If lines are made on the surface of the nourishing gelatine with a needle that previously was stuck into the luminous breeding mass, some grayish-white (some m.m. wide) line-shaped luminous deposits will originate within two to three days. Such line cultures are shown which had been cultivated upon the frozen gelatine in the beaker glass, and others raised upon the gelatine film in glass trays. If a name is written with the immersed needle upon the gelatine surfaces the signature will appear within two days in the shape of grayish-white lines, and a "luminous writing" is thus obtained in the dark. The greenish light of these luminous lines, letters, etc., is so distinct that it can be seen in a room lighted with gas if the outside lines are shaded with the hand a little. After the light had been extinguished the time of day could be easily recognized on the dial of a watch, and the luminosity of the breed could be distinctly recognized at a distance of 8 meters.

Already, three years ago, Fischer succeeded in photographing such luminous cultures in their own light. He used for this purpose the antiplanat of Steinheil. The views were taken in a completely dark cellar.

By using highly sensitive dry plates pictures were obtained at exposures of thirty to forty-eight hours' duration, upon which the luminous breeding mass and the outside lines of the dishes could be recognized. On one photogram the scales of a herring, which was made luminous, could be very handsomely

recognized. Fischer succeeded also at that time in obtaining a passable picture of a watch, which had been exposed for thirty-six hours in the light of two luminous line-cultures. The outside line of the watch, the dial, with the hands and numbers, could be recognized. Fischer resumed these researches last summer. The particularly well illuminating cultures of the luminous bacterium, found in the North Sea, were employed. They were spread upon the bottom of a box, about 1 m. high, in whose cover the camera, with the Steinheil antiplanat, was inserted. The closed box was in the dark room; the dry plates were from Obernetter. After twelve hours' exposure Fischer obtained some handsome pictures. Upon the photograms exhibited during the Medical Congress in Berlin, not only the luminous breeding masses and vessels, but also the watches, samples of printing, etc., developed distinctly and sharp. The watch showed all details, and the parts being nearest to the mass appear in a much brighter illumination. The print can also be as easily recognized as if it had been taken in daylight.

There is no doubt that in America the photographic bacteria researches will gain more supporters and friends, and I would recommend to you the excellent microscopic instruments of Zeiss in Jena.

BERLIN, January, 1891.

[*From our Special Correspondent.*]

ENGLISH NOTES.

THE BULLETIN for a new year comes to hand in a new cover, which is very tasteful and refined. The old outside was endeared to many of us by its associations; but it has had to give way to something better. This teaches the lesson that in this age of rapid progress there is no such thing as finality. Our work may be good; but if we do not improve from year to year we shall certainly "get left."

I have lately been using the following agent for reducing the density of negatives with good results:

Ferric sulphate (persulphate of iron)	12 grains.
Water	4 ounces.

Soak the negative in plain water for half an hour, and then immerse it in the above solution and rock the dish carefully. The reduction takes place visibly and rather rapidly. Remove the plate; wash it well in water; immerse in hypo for ten minutes; then wash again for one hour, and dry. The ferric sulphate dissolves in water but slowly; but by stirring and allowing to stand for a few minutes, a bluish-green solution is soon obtained.

Local reduction can also be well effected by ferric sulphate. Last summer I took a photograph from inside the upper chamber of an old tower, showing a village church, etc., framed as it were in the old stonework of the tower window. On development the brightly lighted landscape came up very dense, and a halo spread inwards from the window. This negative was fixed, washed and dried, and laid aside to be treated—with many others—during the gloomy days of winter, when the camera lies sleeping in its case and enforced leisure comes to the "children of the sun." The negative was then first soaked in running water for an hour to soften the film. The surface of the negative was dried by gently pressing upon it a piece of clean blotting-paper, and the ferric sulphate

solution was painted over the parts which required to be reduced by the aid of a small pointed camel-hair brush. A sheet of white paper laid under the negative enabled the reduction to be watched. More solution was applied as necessary, and the dark deposit which caused the halo was seen to gradually disappear, while the details of the church became visible. The plate was then well rinsed and dried, and gave a really good print.

A great deal of nonsense will doubtless be written about Dr. Emerson's "Renunciation of Naturalistic Photography." The fact is that this original worker with both pen and camera thinks—and thinks truly—that his work has not received adequate recognition, and he enters a forcible protest. As a student of Dr. Emerson's latest book, "Wild Life on a Tidal Water," I can aver that for brilliant descriptive writing, combined with pictures that remind one of Turner, nothing has appeared in literature to equal it.

Trades unionism—or unionism at all events—is actually taking a practical form among British professionals. The lower division—assistants, workmen, etc.—held a meeting at the end of January, at the Polytechnic in London, and resolved to form a trades union. But only forty-three were present, and the active movers appear to me to be working as much for socialism as for any other end.

The "bosses," or heads of photographic establishments, have also united, and held their first regular meeting in Birmingham early in February. While earnestly wishing success to both movements, I very much doubt if either will be a success, although I think the scheme of the "masters" has a better chance than that of the "men." Oh! for a British Photographic Parliament, with a strong and self-sacrificing man at its head; with committees to deal with individual questions, and with power to make its decisions respected. Amateurs should work for professionals and professionals for amateurs. One strong society for each town and district, to which *every* photographer in that town or district should belong. Delegates from each society should meet quarterly, and there should be a grand annual meeting, when all the capabilities of photography should be exhibited and the art dignified.

Collodion is going to make another bid for public favor. The process for the manufacture of rapid collodion dry plates, which was patented three years ago by my veteran friend, Dr. Hill Norris, has been perfected by him, and a factory is now being built near Birmingham to manufacture such plates. They will be found to be of exquisitely fine grain, and to give those "brilliant" negatives, which were so well known to the workers of collodion days. Their price, however, will probably be half as much again as for gelatine dry plates.

The palatial premises of the Camera Club, in Charing Cross Road, London, are now in the occupation of the members; but they are far from completion. By Easter it is pretty certain that the "demon builder" will be exorcised, and the club will then possess a home far in advance of anything belonging to any other photographic society or club on this planet.

I say, advisedly, on this planet. For the recent work of the astronomers, Schiaparelli, in Italy, and Perrotin, in the South of France, lends powerful support to the theory that in the planet Mars we have evidence of a civilization far exceeding (or which has far exceeded) that of this earth. Mars (as seen by the astronomers under the most favorable conditions, with powerful telescopes, and in a perfect atmosphere) is covered with a system of canals which must have required colossal labor to execute. Well, this is just what we should

expect. Mars is a smaller body than the earth, is farther from the sun, and so must have begun life on its own account (by separation from the nebulous mass) earlier than our earth. It would cool more rapidly, and would become fit for life at a period when our earth was perhaps still incandescent, or at all events only inhabited by the dawn-animal—the eozoon. But your Professor Holden declares that with the Lick telescope he is unable to discover the said canals! Now, this is distinctly unkind of the learned dweller on Mount Hamilton! However, the French astronomer has called photography to his aid, and when the "canals" are visible on a dry plate there will be no denying them. Unfortunately our own atmosphere throws terrible difficulties in the way of securing photographs of this kind. There are moments of exquisite definition, during which minute details become visible—through the telescope—to the eye. But such glimpses are of rare occurrence; and the varying density of the atmosphere blurs the delicate outlines upon the dry plate.

Talking of astronomy, I am glad to hear that Mr. A. Taylor, who, under Mr. Ainslie Common, is in charge of the most powerful telescope in the world, the five-foot reflector, at Ealing, near London, has promised a special paper for the next volume of the "International Annual." Mr. George Bankart has already completed a paper on "Carbon Printing" for the same volume, a method which he describes in the simplest way, proving it to be as easy and as inexpensive as silver printing, plus the enormous advantages of absolute permanence and an artistic surface. Among those who intend to "try it" is

TALBOT ARCHER.

REFERENCE has occasionally been made in these columns to the use of wood in the manufacture of paper, a singular instance of so-called "fading" in a carbon print being explained by the use of a paper containing wood fiber. In a recent number of the *Journal de Pharmacie et de Chimie*, M. Wurster gives the following list of reagents to enable wood paper to be distinguished from pure cellulose:

REAGENT.	WOOD PAPER.	CELLULOSE.
Orcine	Dark red	Nothing.
Resorcine	Deep green	Violet.
Pyrogallic acid	Blue green	"
Phenol	Yellow green	"
Phloroglucine	Blue violet	Nothing.

The presence of wood in paper can be detected, and the quantity even estimated, by means of dimethyl paraphenylendiamine.—*Brit. Jour. Photog.*

THE PHOTOGRAPHIC PROCESS.

BY CAPTAIN ARTHUR FREIHERR VON HÜBL.

(*Continued.*)

BROMIDE of silver collodion emulsion can very easily be sensitized by coloring matters, as already mentioned. The emulsion is mixed with eosin and nitrate of silver, or a solution of eosin-silver in weak acids, acid nitrate salts, etc., and a little nitrate silver is added, or a solution of eosin-silver in ammonia is used. An eventual surplus of the latter would give cause to the fogging of the emulsion, and has therefore to be made harmless by careful reduction with some acid. The addition of acid is continued, until a light coloration of separating eosin-silver can be observed, and the solution is then filtered.

Collodion emulsions colored with eosin-silver furnished, with regard to the color-sensitiveness, quite the same results as the wet eosin bath-plate.

If the yellow bundle of rays is to be removed to the emulsion, this is mixed with a neutral yellow coloring-matter soluble in alcohol, for instance, picrate of ammonia. Dr. E. Albert reduces, therefore, the ammonia residue of the eosin-silver solution with picric acid and obtains a sensitizer, making the application of the yellow glass unnecessary.

But this addition reduces the general sensitiveness of the emulsion the same as a light-yellow glass; it can therefore not be recommended if a highly sensitive preparation is looked for. In this case the reduction of the ammonia should be made with a colorless acid.

Having been proven that eosin-silver imparts no red-sensitiveness, Dr. E. Albert introduces a second coloring-matter solution for reproduction photography, consisting of a mixture of ammoniacal eosin-silver and cyanin. The latter differs from the addition of picrate of ammonia, a light-yellow glass having to be used by application of red sensitizer, if the blue of the original is not to act too powerfully.

Albert's crude emulsion, which is mixed with the coloring solution only shortly before use, appears to contain a strong chemical sensitizer. It will stand a strong developer, excels in pretty high sensitiveness and possesses in general quite excellent photographic properties. The ammoniacal eosin-silver solution —with picrate of ammonia—increases the sensitiveness of the emulsion so eminently that it equals a gelatine emulsion in this respect.

The photographic process with colored collodion emulsion excels particularly in simplicity of the manipulations, but it did not meet with general favor, disadvantages of a grave nature adhering to the preparations which have been produced so far.

The plates have to be exposed and developed in a still wet condition, the film is very sensitive to casual contamination, dust, etc., and the emulsion colored with ammoniacal eosin-silver finally keeps only for a short time—fogging already after several hours, particularly at high temperature, and furnishing weak negatives.

The relation of the colored gelatine emulsion is in this regard much more favorable; it can be sensitized only very incompletely by coloring matter, shows always a strong predominating blue-sensitiveness, and if suitable results are to be obtained a very dark-yellow glass should be applied.

The color-sensitive plate cannot be spared any more in reproduction photography; its advantages in making copies of oil paintings and water-color pictures speak for themselves, and in a good many other cases it is successfully employed. Photographic silver prints or half-tone drawings executed in sepia, drawings, manuscripts on yellow paper or paper covered with iron spots, can be reproduced only with correspondingly faultless plates. This is also the only process by which copies of maps and charts, executed in colors, can successfully be made. Parts of such maps are frequently in green or yellow, which is rendered so dark by the only blue-sensitive plate that the black drawing, and particularly the written or printed names, are hardly readable; the rivers and lakes, which are generally executed in blue, disappear completely, etc. But the color-sensitive plate will furnish in such cases negatives which are suitable for photo-lithographic reproduction without any further preparations.

Some parts of paintings are in some cases apparently not correctly reproduced even with the orthochromatic plate, the drawing not setting off from

its surroundings in the desired manner. This appearance is explained by the painting acting not only through its lighter and darker tones, but also the colors, but the reproduction lacks this effect.

If we imagine two colored surfaces, for instance red and green, of such a shade that they will act equally light upon our eyes, orthochromatically taken, they will appear in equal tones, equally gray. The eyes observe both surfaces distinctly separated in consequence of their different coloration; the photographic reproduction furnishes them completely even. Such observations can be made of almost any reproduction of oil paintings; light-gray clouds in a blue sky, green vegetation upon a gray rock, appear frequently on a bad reproduction, and no photographic process can remove this deficiency. For this reason a retouching of the negative will be necessary, by which the deficiencies of the mechanical process are corrected by the hand of the artist. A different character has to be given to the photographic negatives with regard to the prospective method of reproduction. The selection of the photographic process and the manipulation of the same, the time of exposure, manner of development and intensifying, are the means which are at the disposal of the photographer, and he knows exactly how to govern the same. The platinum and bromide of silver paper require better covering, more brilliant negatives, than albumen or even aristo paper; the copper etching (helio-engraving) requires dense, somewhat over-exposed, slightly fogged negatives; the Lichtdruck wants soft, light negatives; for photo-lithography a clear line is sufficient; and for relief helio-engraving a good protecting planum is required, and the line must be narrowed even at the expense of its clearness.

When a wet plate is used, these requirements can much easier be complied with than by application of the gelatine dry plate, the operator, aside from other here ruling advantages, having also at his disposal the easily executable methods of intensifying manipulations, which offer in most cases a very valuable means to vary the character of the negative. This intensifying of the gelatine negatives at present in use is of only a very limited application, and is avoided on account of its complexity. The gelatine plates can be intensified by chemical means only after fixing; they rob the half-tone negatives of the fine shadow details in the high lights, and the line negatives they make rough and remove the fine lines.

For this reason the intensifying (bichloride of mercury and ammonia, iodide of mercury, etc.) should be avoided as much as possible, the easily executable silver intensifying being almost always sufficient. With the not yet fixed wet plate this intensifying will not only effect a harmonious concentration, but promotes also in continued development the improvement of incomplete details. Applied after fixing, it will intensify the drawing, without injury to the clear shadows, but it does not act, like the chemical intensification, only proportionally to the quantity of the reduced silver, but deposits its precipitate in much richer quantity in the high lights, thus promoting the brilliancy of the picture.

A very advantageous silver intensifier for collodion plates is the hydroquinone intensifier. 10 grms. hydroquinone are dissolved in 1,000 grms. water, and so much of an acid is added that the solution, mixed with a third of nitrate of silver solution 1.30, remains clear for about five minutes. The addition of a few drops of sulphuric acid or of 5 grms. citric acid answers this requirement. This in-

tensifier acts softer than the iron silver solution, and has the great advantage, in comparison with pyrogallic acid, that with fixed negatives it can be repeated in broad daylight, without any danger, and repeatedly.

THE APPLICATIONS OF THE CARBON PROCESS TO THE INDUSTRIAL AND DECORATIVE ARTS.

BY P. C. DUCHOCHOIS.

THE *Moniteur dè la Photographie* lately stated that before long the amateurs would print typographically the proofs from their negatives, a small, good hand-press being inexpensive, and the prints, of course, permanent. This I know to be done in France for a long time. During my last journey in that country some of my amateur friends showed me such photogravures about 10 x 18 c.m., which for excellence left nothing to be desired.

It is really strange that the amateurs are more progressive than the professional photographers, and, by a good deal, more versed in the literature of our art. To them we owe the most important improvements, and even the most useful processes ever devised since the time of Daguerre, to which, by parenthesis, due justice is not done by many of the present generation of photographers. It is a fact I have seen in print that some believe Daguerre has nothing to claim in the modern processes. He! who discovered the phenomenon upon which rests the whole of photography: the existence of the latent image—which before him nobody suspected—formed by the agency of light on the layer of a silver salt, and the means of developing it! We now use other mediums to hold the silver compound; we prepare it by other chemical actions, and use more energetic reagents to bring out the luminous impressions, which permits of lessening the time of exposure, thanks to our regretted friend, Mr. Henry T. Anthony, who showed the exalted power imparted to the developer by the alkalies, without which the most rapid dry bromo-gelatine plates would be discarded for obvious reasons; but the principle is the same. The writer of the paper referred to must be forgiven. He does not know the history of his art; he does not know, probably, what a daguerreotype is—the most beautiful photograph ever made.

We beg to be excused for this long preamble. It has its utility for those who can read what is written between the lines.

We will commence in this paper by the description of a process by which half-tone photographic blocks are made by means of carbon prints without the intervention of ruled screens.

CARBON PHOTO-TYPOGRAPHIC PROCESS.

This process consists in developing a positive carbon print on a zinc or, preferably, a copper plate, then to etch it by ferric chloride acting through a grain of resin.

Carbon prints do not adhere well on a zinc plate. Indeed, for double transfer the image could be developed on the plate well polished, and stripped off without any preparation. Therefore, to secure adherence, it is necessary to give a tooth to the zinc plate, and to render it capable of retaining water. The tooth is obtained by a slight etching. It can be done also by grinding with levigated pumice-stone, rubbed by means of tissue-paper in describing small circles. It should be observed that the plate should be neither grained nor polished, but pre-

sent that peculiar appearance of frosted silver wares. No granulation should be visible. This preparation of the zinc or copper plate we insist upon; moreover, in printing, the ink takes better. The plate should be grained, then polished before giving a tooth. This is generally made beforehand, and as zinc is extremely oxidizable, the plate, when polished, should be preserved by a coating of gum arabic from the action of the atmospheric oxygen and other influences.

To give a tooth by etching, the plate is immersed for four or five minutes in the following solution, rocking the tray gently as soon as the plate is placed in it. After rinsing well the plate is ready. We prefer the rubbing method, especially for zinc plates.

The best zinc of "Vieille montagne" should be selected for etching. It is sold in plates of thickness varying from about one and a half to five millimeters. It can be had cut to any size, plane and sufficiently polished. As to the copper plates, the metal should be as pure as possible. Brass can be used, but we think that the results are less perfect. On the whole copper is the best, both for printing and the process in question.

The carbon tissue—that manufactured for transparencies should be selected—is sensitized and printed as usual. The bichromate bath at 3 per 100 of water answers well. We prefer to compound it as follows, especially when using copper plates, on account of the greater adherence of the proof to this metal resulting from the action upon it of chromic acid:

Bichromate of potassium	2 parts.
Chloric acid	1 part.
Water	100 parts.

The engraving obtained with the above tissue, and, in fact, with any one manufactured for the ordinary photographic purposes, is not generally as perfect as it should be, being deficient in half-tones. This arises from the opacity of the coloring matters, which does not allow the light to act deeply through the gelatine coating, and also, probably, from the resistance offered to the passage of the etching fluid. A better tissue is one colored with a transparent or semi-transparent substance of an actinic color, such as soluble Prussian blue, for example. The preparation of such a tissue is easy. Let soak for an hour 30 parts of soft gelatine in 100 parts of water mixed with half a part of white of egg. Dissolve by heat and let the solution boil for half a minute. Then filter through flannel, add a solution of 3 parts of sugar and 2 parts of good soap in 20 parts of hot water, then mix 15 parts of a solution of Prussian blue (blue ink), and filter again. Now, under warm water, place on a glass plate a sheet of strong printing paper about 21 x 27 centimeters, squeeze out the water to insure contact, and flow over, say, 30 cubic centimeters of gelatine. Let the film settle on the leveled stand, and when the gelatine is still tacky, over it place with pressure a wooden frame in order to prevent the paper curling up in drying, and hang up to dry, the paper adhering to the frame.

After printing under a negative—do not forget the safe edge—soak the tissue in filtered water, and under the same, place it on the zinc or copper plate and squeeze out the water to insure a perfect contact. Now, place a few sheets of damp blotting-paper over the tissue and let it stand on the plate for about half an hour—this is important to secure adherence—then proceed. All these operations are explained in the papers lately published in the Bulletin by the writer.

When dry, the proof is grained by dusting, as done by engravers. For this purpose the most simple apparatus consists of a wooden box, 15 or 18 centimeters high by, say, 50 x 60 centimeters, very well planed inside and provided with a well-fitting door, 15 x 35 centimeters, near the bottom, the latter being studded with nails as much as possible driven in at the same height.

For use, a quantity of powdered copal or bitumen is placed in the box, which is then turned over on itself several times to raise in it a cloud of the substance, then knocked with the hands to precipitate the particles which may adhere on the sides and top, when after a certain period the plate is exposed to the fall of the dust. Necessarily the thicker particles, or grains, are first precipitated, then the fine ones, but the fall of the latter is, of course, so much slower as they are finer. Hence, if the plate be placed in the dusting-box after it having been turned over, the coating, or granulation, would be coarse and the plate covered in an instant; but if one wait but a few minutes the layer will not be as thick by a good deal and the deposited particles finer. Again, if the plate be exposed to the fall for a few minutes, the coating will be thicker and the particles closer than if exposed for a few seconds. Therefore it is possible to vary the thickness of the grain and the separation of the particles which form it. It is a study to make; no explanation can be given. For mezzotint engravings, the finer the granulation the better, but for reliefs it should be coarse in comparison, and the grain more spaced, and that according to the purpose for which the block is wanted. For rough printing—newspapers, theatrical bills and the like, which are printed on common paper—it is evident that a coarse and much spaced grain should be selected, and the finest possible for book illustration printed without the text on good, strong paper. To graduate the grain, the copal and bitumen powder may be sifted through sieves of different meshes, as is done in lithography for the sand, in order to obtain Nos. 80, 100, 120 and 140 grain.

Grained, the plate is carefully removed from the dusting-box and gradually heated on a grate over the flame of alcohol placed in a tin dish, to soften the particles and fix them upon the plate, so that they should not be washed off by the etching fluid, care being taken not to apply too much heat, else the particles smelting, instead of being softened, would spread, attach to each other and form an even coating which the etching fluid could not penetrate. It is easy to ascertain the exact moment the plate is sufficiently heated; it is when the copal, which is yellowish-white, takes a deep amber color. The grain being secured, the plate is allowed to cool, then backed with a stopping-out varnish, consisting of

Bitumen	16 parts
Yellow wax	8 "
Benzine	100 "

The margin should also be protected by this varnish, and upon it one or two lines should be traced with a finely pointed bone by scraping the varnish clear to the metal. These lines serve to ascertain the progress of the biting in, and, consequently, when the operation is at an end.

All this being done, the plate is ready for etching. Now, one comprehends that the blacks of the image, being formed by the gelatine, acted on by light at various degrees, are more or less or not at all permeable to liquids, while the whites, which should be etched deeply, are easily permeated, and, therefore, that the plate will be bitten in in proportion to the degree of permeability: hence the process.

To etch, the plate is immersed in a solution of ferric chloride at 45 degrees Baumé, which by slowly acting permits one to see the biting-in, taking care during the operation to brush over the surface of the plate with a soft brush in order to remove the oxide formed, which otherwise would interfere with the regular action of the ferric salt.

In this, as indeed in every typographic process in half-tone, the hollows being close, it is impossible to bite in deeply; moreover, that is not necessary, for, by the fact of the hollows being very close, the roller cannot press in provided it is hard, and if the work be stiff there is no danger that the dots or lines will be blocked up. When this happens the remedy is at hand.

The plate can be etched for, say, five minutes at a time, when it is washed under the tap and the depth ascertained. When the finger-nail catches quite well on the test lines on the margin there is no advantage to try greater deepening of the hollows, which would only result in widening them at the expense of the reliefs; moreover, should they not be deep enough the defect would be easily corrected by inking the plate and etching again. It should be, in any case, observed that the duration of the biting-in, or, in other words, that the depth of the hollows, is subordinate to the fineness of the grain. The reason is obvious. With ferric chloride as an etching fluid it very seldom happens that by prolonging—within certain limits, of course—the duration of the biting-in, the engraving be spoiled, as it acts perpendicularly with very little lateral action; therefore, the dots or lines are rarely undermined as it so often happens by etching with nitric acid.

When the biting-in is sufficient, the copal is dissolved with benzine, the gelatine with a solution of potash; and the plate, well rinsed and dried, is ready to be mounted type-high on the wood block.

(*To be continued.*)

[*From Photographische Correspondenz.*]

IODINE IN THE HYDROQUINONE AND EIKONOGEN DEVELOPERS.

BY ALEXANDER LAINER.

For the following experiments I applied a solution of 1 grm. iodine in 50 c.c. alcohol and diluted with 50 c.c. water.

Three to six drops of this 1 per cent. iodine solution act extremely remarkably as addition to 30 to 40 c.c. of hydroquinone developer. The appearance of the picture is very much accelerated; the picture appears almost instantaneously in all details and becomes stronger in prolonged development; the contrasts are softened, and at less illumination of rich contrasts or weak-working plates a flatness of the picture takes place. As an addition to hard working hydroquinone developers 1 to 4 drops of above iodine tincture prove excellent, and a very handsome gradation of the half-tones is thereby obtained, while a large addition equalizes the tone. A reduction of the sensitiveness was not observed.

Four drops of iodine tincture in 40 c.c. of eikonogen developer do not act very remarkably; with and without additions of iodine 25 degrees Warnerke were reached in three minutes of continued development. The iodine addition increases the clearness of the plate and acts favorably upon the gradation; even

10 drops of iodine solution produced here no flatness, but the thickness of the first numbers was considerably reduced. Iodine tincture in small quantities facts, therefore, in the eikonogen developer similar as in the hydroquinone developer, although not in such a powerful way.

An accelerating of the development is not accomplished by the addition of iodine; on the contrary, the development has to be continued to obtain great density.

A very valuable means is therefore given in the iodine or potassium iodide addition to be able to act upon the character of the negative during development with oxalate, eikonogen or pyrogallol. While a bromide of potassium solution, 1.10, is used to obtain greater density or more contrasts, the contrary is arrived at with the iodine addition in different degrees, according to the quantity of addition, and, what is very important, without detriment to the sensitiveness of the plate.

The application of tincture of iodine, also of iodide potassium, can, therefore, be well recommended for instantaneous views as well as for portraits and landscapes.

[*From the Journal of the Franklin Institute.*]

PHOTOGRAPHY IN THE COLORS OF NATURE.

BY F. E. IVES.

[A Lecture delivered before the Franklin Institute.]

THE lecturer was introduced by Professor Edwin J. Houston, of the institute, and spoke as follows:

Members of the Institute and Ladies and Gentlemen: I have already made two communications to the Franklin Institute on the subject of photography in colors. My object in lecturing upon it at this time is to go further into its history, to give such accurate knowledge of the subject as will make the force of my criticisms more readily apparent than heretofore, and to better demonstrate my own method. The substance of my lecture might have been more appropriately presented in the form of a paper to be read at a stated meeting of the institute; but a satisfactory presentation of a subject so complex and difficult could not be made in the brief space of time allowed for the reading of such papers, and I offer this excuse for presenting it as a lecture.

Heliochromy—meaning sun-coloring—has been settled upon as a name for processes of photography in natural colors, or in the colors of nature. There are two kinds of heliochromic processes. In one, the light itself produces the colors, by direct action upon the sensitive plate. In the other, light does not produce colors, but is made to regulate their distribution and combination. Some of the colors of the spectrum were imperfectly reproduced by a process of the first kind nearly thirty years before the discovery of the daguerreotype process. Seebeck, of Jena, in 1810, found that chloride of silver, after preliminary exposure to white light, is colored a brick-red by prolonged exposure to the red light of the spectrum, and a metallic blue by the blue light. After the discovery of the daguerreotype process, several experimentalists tried so to modify the preparation of the chloride of silver plates as to make them capable of reproducing all the colors of nature. In a photographic text-book, published so long ago as in 1853, I find the following statement: "Even the long-debated question of the reproduction of the natural colors by the agency of light seems on the point of solution. * * * M. Niepce de St. Victor, from whose well-known character as an experimental philosopher much might be expected, has forwarded to London, as we understand, specimens of proofs in which every color is reproduced with a vigor and

richness truly wonderful." Similar announcements have been made since that time, but the best results ever actually shown were nothing more than interesting curiosities. Dr. H. W. Vogel,* who recently had an opportunity to compare some of the latest and most-talked-about of these "photographs in natural colors" with the original colored pictures from which they were printed (by contact), says:

"The original is one of those transparent window pictures in bright colors, brought into market by Grimme and Hembel, in Leipsic, as a substitute for glass painting. It represents a Cupid with yellowish-brown hair and wings, and a small blue scarf around the waist, whose ends wave in the wind. He carries an arrow piercing two hearts of ruby color; between the knees he holds a quiver with yellow ornamented opening, and in his left hand the upper part of a large brown cross-bow, with blue and yellow mountings, the lower part of which rests, with the figure, upon an idealistic thistle blossom of red leaves. The stem is of the same color, and the plant shows fresh green leaves. The picture has a pale blue background, and red, green and yellow ornamentation around the border in very pronounced colors. This border ornamentation affords an excellent means of comparison with the print. The latter, in opposition to the bright original, shows a greenish-gray, partly dark, ground. At first look, one recognizes readily that of all the colors only the red of the original has been distinctly reproduced. But it is not true to nature; it has a copper-red color, and differs decidedly from the vermilion and carmine red of the original. Besides this copper-red, only the blue of the scarf and the mountings of the cross-bow and quiver come out as a very pale light-blue, with no natural resemblance. The black lines of the border decoration appear alongside of this as a violet-black. These are the tones which to some extent have a similarity of color, but with the other colors it is not so favorable. The yellow squares and green trapezoids of the border decoration appear neither yellow nor green, but have a grayish-red tone. The blue fields are not blue, but greenish-gray, like the ground. It is most singular that several parts are reproduced in red, which actually are not red, but brown-yellow, as, for instance, the hair, the wings, the cross-bow, the thistle, etc. The green leaves in the print show no fresh color, and the red leaves of the blossom and the body of Cupid show only a pale flesh color. * * * The resemblance of the new photographic pictures to natural colors is, therefore, not very favorable. Only two colors can be recognized distinctly in the copy, of which the red is the best; in a less degree the blue, which is weaker as far as the picture is concerned. The blue in the ornamentation around the border, and all other colors, either have not been reproduced at all, or are entirely unlike the original. * * * If I compare the sample before me with the pictures I have seen in 1867 of Niepce de St. Victor, Becquerel and Dr. Zenker, I must confess that those much-older productions were richer in color, although the tones deviated likewise considerably from the natural ones."

According to Capt. Abney, the red end of the spectrum produces red by promoting oxidation; the blue end, blue, by its reducing action.† Prof. Mendola ‡ says: "It may at first sight appear improbable that the coincidence between the colors of the spectrum and the colors of the impressed film is a mere accident; but, although this is difficult to believe, I venture to think that it is an accidental coincidence and nothing more. * * * In the best specimens of these photo-chromatic spectra that I have seen, the colors were certainly nothing more than approximations to the pure spectrum colors; and even in these spectra, some of the colored effect was due to the unaltered ground-color of the film in regions where some particular color had produced no action at all."

The process by which such imperfect results have been obtained is too slow to be applied successfully to camera photography, and the results are not permanent.

In view of all these facts, it would appear that there is no scientific basis for a be-

* Anthony's BULLETIN, 1890, p. 325. † Anthony's BULLETIN, 1890, p. 307. ‡ "Chemistry of Photography," p. 324.

lief that any material improvement can ever be made in this process, and that all so-called progress along this line is a delusion. It is true that some distinguished photographic writers continue to regard every new modification of this old process, and every new result of experiment with it, as another step toward the photographic reproduction of the natural colors; but I have no doubt that if the same writers had lived two hundred years ago, they would have regarded the production of new yellow-colored metal alloys as steps toward the transmutation of the baser metals into gold.

In my opinion, the first step toward the solution of this problem was taken by Henry Collen, Queen Victoria's painting-master, who, in 1865, invented a plan of composite heliochromy. His plan was based upon a false conception of the nature of color, and means for carrying it out were then unknown; but it was a bright idea, and contained the germ of a successful process. Collen's original communication of his idea appeared in the *British Journal of Photography*, October 27, 1865, and reads as follows:

"It occurred to me this morning that if substances were discovered sensitive only to the primary colors—that is, one substance to each color—it would be possible to obtain photographs with the tints as in nature by some such means as the following:

"Obtain a negative sensitive to the blue rays only; obtain a second negative sensitive to the red rays only, and a third sensitive to the yellow rays only.

"There will thus have been three plates obtained for printing in colors, and each plate having extracted all its own peculiar color from every part of the subject in which it has been combined with the other two colors, and being in a certain degree analogous to the tones used in chromo-lithography. Now, it is evident that if a surface be prepared for a positive picture, sensitive to yellow rays only, and that the two negatives, sensitive only to blue and red, be super-imposed either on the other, and be laid on this surface, the action of light will be to give all the yellow existing in the subject; and if this process be repeated on other surfaces sensitive only to red or blue, respectively, there will have been produced three pictures of a colored object, each of which contains a primitive color reflected from that object.

"Now, supposing the first great object achieved, viz.: the discovery of substances or preparations each having sensitiveness to each of the primary colors only, it will not be difficult to imagine that the negatives being received on the surface of a material quite transparent and extremely thin, and that being so obtained are used as above—*i. e.*, each pair of superimposed negatives to obtain the color of the third—that three positives will be obtained, each representing a considerahle portion of the form of the object, but only one primary of the decomposed color of it. Now, if these three positives be received on the same kind of material as that used for the negatives, and be then laid the one on the other, with true coincidence as to the form, and all laid upon a white surface, it will not be difficult to imagine that the effect would be, not only the representation of the form of the object, but that of its color also, in all its compounds.

* * * * * * * * * *

"Although the idea I have endeavored to express in words may be utterly worthless, I am unwilling to let it slip away without notice, as it may on the other hand contain a germ which may grow and bear fruit in due season."

The language of some parts of this communication is ambiguous; but, taken all together, with due allowance for the writer's unfamiliarity with photographic technology, it clearly amounts to a suggestion to make three photographic negatives of an object—one by the action of red light, one by yellow, one by blue; to print from each pair of these negatives (superposed as one) a transparent positive having the color represented by the third negative, and to superpose on a white surface the three prints thus obtained.

It was not possible to carry out Collen's suggestion at that time, because there was no known process by which plates could be prepared which were sensitive to single colors only, and no photographic plates were sensitive enough to red and yellow

to admit of the production of such negatives by exposure through selective color screens. Had it been possible to carry it out, the results must have been very imperfect, not only because the entire procedure is based upon a false and misleading theory of color, but also because superposing two negatives to act as one would double the intensity of such parts as represented white, gray or pale-colored objects, with the result that if the color prints were made to show all the details of the negatives, the finished heliochromes would show all bright colors as if mixed with equal parts of black pigment.

(*To be continued.*)

[*From The British Journal of Photography.*]

NATURAL COLORS ON THE LANTERN SCREEN.

BY ALBERT W. SCOTT.

THE problem of photographing colors direct by the camera, in the same easy way in which light and shade is now secured, is one that has attracted many minds, but, so far as published hitherto, without much practical result. There have been two systems in use by experimentalists : one may be called the chemical method, in which the colors are produced by the various tints assumed by silver compounds under certain conditions; while the other may be styled the physical system, in which the component parts of light are separated, and, while separated, made to produce various negatives, colored positive prints or transparencies being afterwards made from these negatives and combined together, so as to imitate the colors of the original object.

The chemical method referred to is obviously one that can only be pursued with any hope of success by those proficient in advanced chemistry; those who are not so gifted must perforce study the physical system.

During the past summer and autumn I have been experimenting in the physical line of color-reproduction, the method of combining the colored positives being that of projecting their images on a lantern screen by a multiple lantern. My early attempts were highly interesting to the experimenter, but not very successful, owing to the colors not coming out right; reds would appear as yellow, greens as blue, and so on, until I began to have a strong suspicion that the theory of light which I was working upon was not correct. This theory was that of Sir David Brewster, commonly accepted by artists, it being that white light was a compound of red, blue and yellow.

The spectroscope came to the rescue, and removed most of the difficulties in the way. The instrument used was of the roughest home-made description, but it soon proved that yellow was a double color, composed of green and red. It showed that nearly every transparent dye, glass or pigment was a compound color, admitting several kinds of color to pass through it ; and it eventually proved to my complete satisfaction that white light is a compound of four primary colors, which are as distinct in their individuality as four of the chemical elements or four different persons.

These four primary colors are, practically, never seen singly in nature; and the colors we see are compounds of the primaries, bearing no more resemblance to their component parts than water bears to its elements, oxygen and hydrogen.

Further, it was found that certain pigments are transparent to some primary colors, but stop out the others as effectually as an iron plate. For example, Prussian blue in a moderate thickness is perfectly opaque to the red, but more or less transparent to the other three primaries. Another blue is opaque to the green rays, but partly transparent to the red.

About fifty transparent colors were tested in this way, and an analytical table was drawn up, giving the exact composition of each color in terms of the primaries ; and after this was finished it was easy to select combinations that would be opaque to three primaries, and transparent, more or less, to the fourth. Four such compound screens

were made up and used for the multiple camera with four lenses, with which the experiments were made.

In order to simplify the work, the four lenses were fitted with stops, having such apertures as were required to give an equal exposure to each quarter of the sensitive plate employed, and one large cap covered the four lenses. Isochromatic plates were necessarily used for the negatives, ordinary plates being quite unaffected in two of the sections. Using a color-sensitive plate, it was necessary to have the lens of the red section used full aperture, *f*-4; the other three admitted only a small fraction of light —about one-fiftieth—as compared with the stop for red.

The exposure of the plate under these conditions was comparatively long, two seconds being the shortest exposure yet given with success; this secured the colors of a bay horse and trap in full sunshine. In the shade, for portraits from life taken out of doors, thirty to a hundred seconds were given. The plates were Edwards' Medium Isochromatic; no other plates were tried, as it would have involved a re-arrangement of stops; but it is probable that other plates could be obtained more sensitive to the red rays, and the use of such would enable the exposure to be lessened.

These compound negatives were taken on 3¼ x 3¼ plates, each picture being only one and a half inches square. Positives were made by contact on ordinary lantern plates from the negatives, and being provided with paper mats having four apertures, one for each picture, they were mounted with a plain cover glass in the usual way.

There was thus a set of lantern slides of the usual size, each slide presenting four little pictures in black and white, all alike, except in the shading. The slight and almost imperceptible differences of density in the four pictures was the latent form in which the colors of the original object had been secured. With very gaudy colors the differences were conspicuous; for instance, a deep-red rose would appear snow white in the red section, and nearly coal black in the other three divisions of the slide.

The latent colors of these slides can only be made manifest by the aid of a special optical lantern having one lime-light and a four-inch condenser, in front of which is a glass painted with gaudy colors, imitations of the primary colors, one color for each quarter. In front of this glass is placed the compound slide; thus red light goes through one section, and our snow-white rose would allow the red light to pass through it, while the coal-black roses in the other sections would effectually stop the other colored lights from passing. The four images all combine together into one on the screen, and our rose appears with its natural red color, while its surrounding objects for similar reasons also display their true colors. This is the outline of the patent-applied-for process called the Verak process.

About forty Verak slides have been made in the course of the experiments; these slides are not considered perfect, but they prove that all the main colors of any object photographed can be reproduced with some degree of accuracy, and with almost any degree of vividness.

The chief difficulty lay in the adjustment of the colored screens, both of the camera and of the lantern. The camera screens have not been altered for three months past, and seem to be practically perfect in color; but the lantern screens have only recently become satisfactory, and possibly further improvements will be made which will increase the brilliance of the Verak image on the screen.

As a memorandum of coloring, I find the Verak photograph more reliable than my memory. I sometimes found errors in the tints shown on the screen, but on further examination of the original, the error was on my side, and the Verak was right.

Mr. Andrew Pringle, feeling an interest in the invention, has kindly promised to demonstrate the machine if it proves workable in his hands and comes anywhere near up to his expectations.

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

[*From The British Journal of Photography.*]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

(*Continued.*)

CHAPTER VIII.—THE LOWER PORTION OF THE FACE.

TO the most casual of observers the nose will always appear a leading, if not absolutely the most prominent, feature of the face; and, indeed, the success of a portrait will depend very materially upon the degree of success with which we treat it. This remark applies from first to last, as it is a matter which exercises the ability of the operator quite as much as that of the retoucher. The feature which must guide a skillful and thoughtful operator, and the one to which he would give his first attention, is the nose. In most cases, upon this feature will depend which side of the face he will select for his portrait, and still further will this feature be his guide as to whether he will pose his subject full face, profile or any of the intermediate grades. To secure repose as well as beauty (when possible) to this feature is, therefore, the artistic operator's first care.

It must be only natural to suppose that a feature which is of such great consideration to the operator must be of no small importance when placed in the hands of the retoucher. Many times a kind of compromise will be found advisable, if not altogether necessary, in order to produce a good picture and striking likeness. The operator, in studying his pose, may find it impossible to so turn the head as to secure the greatest degree of likeness or individuality, and at the same time secure beauty and repose to the nose. In such cases he shares his troubles with the retoucher, and so arranges his subject that a few skillful touches judiciously placed by the latter will put matters satisfactory for both. In all such cases the combined efforts of the operator and retoucher, and their mutual endeavor to help and work with each other, can alone succeed in producing successful and artistic pictures.

Many times the retoucher will be called upon to give absolute form to the nose, and this, it is needless to say, will often tax his ability to the fullest. A nose, for example, may have a very sudden rise at that point usually known as the bridge; and should the head be so posed as to show this fact too plainly, either through an oversight on the part of the operator, or the fixed desire of the sitter to be taken in a certain position, or any other cause whatsoever, the retoucher must judiciously fill in this hollow. Although filled in in such a manner as not to attract or rivet the attention of an observer, the most modified indication of same must be retained, so that those who know the sitter may think they see it, but under most favorable conditions. The ordinary observer will, of course, fail to discover the assistance rendered by the retoucher, and, consequently, have no fault to find. All this, however, would not be so if we, as retouchers, were to remove all trace of this hollow. Were we to remove it completely it is more than likely that every one would observe the sweeping change, and be as likely as not to declare the portrait not a bit like the original; in fact, that it has been deprived of all likeness and character by the process of retouching. One touch, more or less, of the pencil may mean the difference of success or failure in such a case; therefore, the greatest care must be employed.

These remarks will also refer to all cases where the retoucher may be obliged to depart from or alter the drawing or outline furnished by the negative. The more skillful the hand that directs these alterations, the more successful the result must necessarily be. Many times the outline on the shadow side of a face may give, in parts, a certain squareness of formation to the cheek which is anything but pleasing. The least touch of the pencil may suffice to cure this defect, and that, too, without in the least altering the likeness; on the contrary, the expression and intellectuality of the head may be enhanced very considerably. The "heavy jaw" may also be similarly

treated on the light side when required; but generally it is not so often or so strikingly observable as on the shadow side. This alteration or, may we say, rectification of outline must always be carried out with the greatest care and judgment, as the least modification may produce very considerable effect, and which must show to the improvement or detriment of the picture. All these points demand a large amount of attention from the student; and, as a primary advice, always err on the side of moderation in making these alterations, as you can always add to, but seldom advantageously reduce the work when once it is fixed.

To return more strictly to the nose and its treatment, we will for the moment put all other considerations on one side. The first thing to strike an observer is the light running along or down the ridge of the nose. The treatment of this must be very carefully and delicately carried out, otherwise the rest of the work upon the face, however nicely done, will be very considerably deteriorated. Thousands of negatives are hopelessly ruined yearly, although in other respects fairly well retouched, by having the likeness spoiled by the introduction of a strong line of light running down the nose, altogether out of character with the feature itself, and almost always altering the shape of it. There are many who think that they have mastered the most essential points in the retoucher's art when they fancy themselves capable to put a patch of light upon the forehead and run a straight line of the same down the nose. At the end of this latter they put a spot or bulb of extreme light, and shake hands with themselves on having, if not absolutely made the feature under treatment a success, at least produced an original work of art. People so easily pleased with their own work should be very happy, and no doubt they are, if they have £500 a year to back them up. But such a self-satisfied manipulator will have unlimited difficulty to find any good-class photographer who will allow him to amuse himself with his negatives.

The line of light running along the ridge of the nose requires but little, and I never advise that little to be in the form of a continuous line of light. In the ordinary run of negatives fairly well lighted, this line of light is generally sufficiently indicated to thoroughly determine the exact shape of the nose. Now, if we alter this we must necessarily alter the feature, and thus lose the likeness. I have always held that by starting the light at the upper or top part of the nose, and carrying it down half way, that is, nearly to the center, then making a slight break, and finishing by placing the high light on the end or lobe, all the effect of a continuous light is gained, without the many defects that would necessarily accompany such a treatment. The eye, if I may so express myself, is carried over the break, and can fancy an unbroken line of light to exist. This treatment has many points to recommend it. Properly done it will insure regularity of formation to the feature, but not really alter the shape or expression of it. By such treatment many noses, in themselves irregular, possessing peculiar distinctiveness, and even holding the greatest amount of likeness as a result thereof, may be benefited and made presentable in a picture; while the continuous line of light may make a better nose, but all resemblance may at the same time be completely lost.

The apparent length of the nose is greatly influenced by this line of light. By its judicious adjustment the idea of length may be imparted, which will in some faces produce dignity or importance, whereas, left to itself, the nose may be a very insignificant item, and fail to produce a balance with the other features. Of course, this idea of breaking the line of light must only be accepted in a general sense, as must the position of the break be determined by the judgment of the retoucher. Sometimes, by making this light more intense and broader at the middle, a better shape will be imparted; in fact, fineness or breadth may be given to the nose by the skillful placing o this light. Sometimes the end of the nose may show signs of a double formation, seldom very apparent, and in such cases the light will have to be sharper, or, perhaps it would be better to say, more angular.

The delicate cartilage forming the wings of the nose should not go without its

proper share of attention. A round, soft and diffused light should be placed upon them, just a shade above half-tone, and when the inner portion of the nostrils may appear too dark, the retoucher will do well to touch lightly over it, in order to relieve the intensity of the shadow. In the plain photograph, or the negative before it is retouched, the correct balance of light and shade is not always secured, the shadow in this case being greatly intensified; how much more noticeably, therefore, must this balance be lost when all the surroundings have been worked upon, if we neglect to touch the nostrils? I have seen the nostrils in such photographs print so black they might as well have been two blots of ink, and of course thoroughly ruined the effect of the pictures. And a little thought would have remedied all this.

Having so far treated the feature itself, we must now treat the surrounding parts connecting it with the rest of the face. The high light on the nose must necessarily be soft and never too strongly defined; therefore care must be taken, in softening it into the half-tones, not to lose too much of the latter. The delicate shade or half-tone down the nose—between it and the cheek in light—is of great value to the picture, and the more it can be preserved, the better for the portrait. This half-tone will be invaluable, not only in helping to make the nose stand out in relief, but also to enable the retoucher to produce rotundity in the cheek. Rotundity should always be sought after—flatness, avoided. In nature, faces may sometimes appear flat, but they are really round. I dare say you have many friends who have the reputation of possessing "square" heads, but examine them closely—they will not be very far off the round.

In many faces the shape of the nose may almost be said to depend upon the careful treatment of the surrounding parts; this will be most observable in such faces as have a very slight, if any, indication of the labial furrow. It is a peculiarity among Americans that they seldom possess this trait. Such subjects are necessarily rather difficult to treat successfully, for the absence of this furrow will make the nose appear much larger, and to add to the trouble this defect is likely to be exaggerated by photography. The Americans are not the only people who are generally wanting in this formation; as a rule, the Swedes and Indians in a large majority possess the same peculiarity. To those who are not used to negative-retouching the presence or absence of this distinctive furrow may seem of but slight importance, but to the regular retoucher it is an invaluable adjunct.

The upper lip, coming immediately under the nose, necessarily has much to do with the well-being of the nasal organ, and must be retouched with considerable care. There is a great deal of distinctive character about this upper lip; indeed, much more than people are likely to think at first. Of course, if covered by a heavy mustache we are at once set free from all trouble; but in men's faces, shaven—and in ladies, faces—the matter is different. This portion of the face has not only to aid in showing off the nose to advantage, but the shape and expression of the mouth will depend very largely upon our treatment of it. In the center of the upper lip is what we may best describe as a groove, and which terminates in the septum of the nose. After generally clearing the entire surface, we must brighten to a consistent degree the projecting edges of this groove, increasing gradually the light on same as it approaches the end at the edge of the lip. Done carefully and tastefully, this will help very much toward imparting expression to the lip proper, and will in turn tend toward the vivifying of the mouth and its surroundings. The light on the light side of this groove must be brighter and somewhat longer than the one on the shadow side; this is important, not only with an idea of helping the perspective, but because there is a natural shade thrown by the nose over the light on the shadow side, and which must on no account be disturbed at this point. It is marvelously easy in these small details to almost ruin a correct likeness.

In cases where there are distinct indications of a strong beard or mustache, the same must be carefully preserved, or else much character and likeness will be lost, and the portrait generally lack what may be termed color. This remark will also include

the working toward the corners of the mouth. If the delicate little half-tones be not preserved about the mouth, expression must be weak, and the lips appear by contrast much too dark and heavy to be natural or pleasant to the eye. It is only by careful attention to all these details that one can cultivate a thorough knowledge of the necessities of a negative and the various means to obviate their defects. One may take up a number of negatives and not find one to which all these remarks will apply, but one will be sure to find them all demanding some different portion thereof. In all cases it is best to know a little more than is required, than be forced to work in uncertainty for want of sufficient knowledge of the subject under treatment.

LANTERN SLIDES.

To the Editors of Anthony's Bulletin :

In your journal of 14th February, page 78, you publish a communication, by Edgar G. Lee, in which some statements appear that are not perfectly clear and vary with my experience. There is much diversity of opinion regarding lantern slides, but they have been a hobby of mine for a quarter of a century. I began with the wet collodion process, and continued it for all my slides until the advent of dry plates; and upon becoming acquainted with the latter gave away everything connected with wet-plate photography except the negatives. The proprietors of your journal formerly made a collodion, I forget the name, but it was an emulsion, containing a very small proportion of silver, but for lantern slides it was superb. To intensify the slide, it was only necessary to allow the developer to remain on the plate until sufficiently strong, even when copied from an over-timed negative which was full of detail but flat and thin. For a long time after I changed to dry plates I was puzzled to produce the same effects with them, but have succeeded at last. In the article I refer to, Mr. Lee says: "Whilst on the one hand a negative of the most extreme density will make a passable slide, thinness and want of contrast of the character which is suitable for bromide printing is, for slide work, absolutely hopeless." I understand from above that the "most extreme density" refers to iron-clad negatives, termed by some "chalk and charcoal," as contrasted with over-timed, thin negatives, but full of detail. First, I have never seen any passable slides made from such iron-clad negatives. The results resemble in the slide the effects shown in a contact print from same, and the contrasts are too strong. To print long enough to get detail in the shadows, what becomes of the high lights and skies? They must become filled up, and the reducer that will benefit them spoils the shadows. As to the thin negative, very handsome results can be produced, but you must be patient in procuring them.

The printing must be very short, rather under-timed, and a very weak developer used. Anything is better than pyro for these. Your firm prepare an article they call the "Climax Developer." I do not ask what it is, but know from its action that it is not pyro, and it cannot be excelled. It is in concentrated form, and I take of same 1 ounce, to which I add 5 to 6 ounces of water and 10 drops saturated solution bromide potassium in water. This operates very slowly, but if you wish to produce fine work the extra time is well spent. It is not time wasted, as one can keep two or three traysful going at one time, and up to a certain point the slow development of lantern slides is far preferable to quicker. I find that the mixture referred to gives a slide of a warm, beautiful tone, and there is none of the hard, gray tone often produced by too quick

development. I have found that the finer the silver print that can be made from a negative the better such is adapted for good lantern slides. I see by your journal that our old friend Roche is publishing his wet collodion process for making slides, and this will be hailed with delight by many who have wanted him to do this for years. As his results show, the process is far ahead of dry plates, but unfortunately less cleanly, and many will hesitate about starting operations in same ; but the cost is so much less and the resulting slide so much finer, those who will have nothing but the best will probably enter the lists; and I should not wonder if, at no distant day, the debates at the different societies would be on the best collodion, developer, toner, etc., as the lantern slide is growing in popularity and I am glad to see it. To return to my first point, I wish to add one more objection to the letter referred to, and that is, it would give one the impression that the most suitable negative for a bromide print is a thin negative with want of contrast. My experience—and I know that a large number of others will agree with me—that the better the negative is adapted for a good lantern slide, the better it is suited to make good bromide prints, good, rich, brilliant negatives full of life and detail. Yours truly,

E. Beebe.

THE WATKINS EXPOSURE METER.

Five factors or conditions determine the duration of a photographic exposure in the camera : light, plate, subject, diaphragm and distance. The instrument before us is designed to make the calculations resulting from all these acting together, and to determine mechanically the correct time of exposure under any given circumstances. In other words, it is a calculating machine for exposure. It depends first upon the determination of the power of the light, by allowing the latter to act upon a piece of specially prepared paper to produce a standard tint; and secondly, upon the sensitometer number of the plates used. These two factors, together with the number of relative value assigned to the subject, and also the diaphragm value (f/n), give upon the exposure meter a certain number which is the number of seconds or parts of seconds that the plate used must be exposed to give a good negative. The instrument consists of a cylinder with four brass graduated rings and a chain pendulum in a box to determine the time necessary to obtain the standard tint. The principles upon which it works are correct, and the results are concordant with experience. For those who are learning to make correctly timed negatives it will prove a valuable aid, and is certainly worthy of being used by all who desire accuracy in their work.

OUR ILLUSTRATION.

The handsome gelatine print with which we illustrate this issue of the Bulletin is one of those examples of amateur photographic work that it is a pleasure to reproduce. It gives us a glimpse of home life that the studio of the professional photographer seldom reproduces with the same touch of nature that is so often caught by the amateur.

The exceedingly life-like expression of the little son of our good friend, W. J. Hickmott, of Hartford, calls forth an exclamation of surprise from all who have seen it, owing to the particularly happy mood that the little one appears in. The title, too, is singularly appropriate, and speaks to us at once from Baby-land.

The reproduction of the original by the Heliotype Printing Co., of Boston, needs no comment from us; it speaks for itself.

ANTHONY'S

Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,

Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,

and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THIS society held its monthly meeting at the rooms, at 113 West 38th street, on Tuesday, February 10th. The meeting was called to order at 8.30 P.M. by *President* STEBBINS and the Secretary's report read and adopted.

The subject for discussion was "Orthochromatic Photography," and a paper upon this subject was sent by Mr. A. Steiger. The author himself not being present, the paper was read by the President. Some capital illustrations of the benefits accruing from the use of color-sensitive plates were exhibited. The prints were upon platinum paper, and were from plates prepared after the formula of Dr. Vogel.

Miss Catharine Weed Barnes exhibited a 5x7 hand camera which had been made for her by Newcomb & Owen. It is fitted with a W. A. Euryscope lens, and the shutter used is one of Prosch's triplex.

The Joint Exhibition Committee announced that an exhibition would be held at the Fifth Avenue Gallery, between 34th and 35th streets, on May 25th. Mr. Palmay and Mr. W. H. Low are the judges. Mr. Murray suggested that the society should not attempt an exhibit, as there was hardly sufficient time for the members to make a creditable display. It being, however, pointed out that quality and not quantity was the desirable thing, it was resolved that the society do its best.

The Lantern Slide Committee announced that on February 20th Mr. R. F. Lawrence would exhibit a series of slides from negatives taken in Morocco and Holland.

A smoking concert was announced for February 23d.

On the motion of Mr. Murray, the meeting adjourned at 9.15.

BROOKLYN ACADEMY OF PHOTOGRAPHY.

THE annual meeting of the Brooklyn Academy of Photography was held, February 11th, at the headquarters of the organization, 517 Fulton street.

President FRANK LA MANNA presided, and *Secretary* HERMANCE TREMPER recorded the proceedings. *President* LA MANNA made his annual report. He said that the advance made by the academy during the year was very flattering. He added:

"Our roll of members makes a most excellent showing in quantity, and, permit me to say, in quality as well. Our financial condition is satisfactory; we have no debts, comparatively few dues remain unpaid; we have a comfortable if not opulent balance in the treasury, and the quantity of our chattels has perceptibly increased. Our lantern evenings have been very successful, and, we have every reason to believe, interesting to our audiences. In fact, the attendance at these evenings has so increased that you may shortly have to consider the necessity of either using a larger hall than the Hoagland or limiting the number of tickets issued. The Centennial evening at Association Hall was a most satisfactory one, practically demonstrating to a large and cultured audience the results of some of our historical work. This branch of our labor—that is, the carrying on of a pictorial history of Brooklyn and of New York—is undoubtedly the one to which we should bend our utmost energies. The idea of such line of photography originated with the academy, and as in its exercise scope is given to every artistic sense and to all technical ability, and as not a very great amount of labor from each member would in course of time compile volumes that would transcend in interest any manuscript, and describe people, places and actions

where mere words would utterly fail, and it is to be hoped that our blizzard, Centennial and other albums are but predecessors of many of still more historical interest to follow. Our cheerful meeting-room has brought about a weekly informal reunion, where photographic chat, exchange of experiences, both successful and unsuccessful, and displays of pictures and of slides have proved powerful magnets to bring the members closer together and to improve each others' acquaintance. The first conference of amateur photographic societies held in New York did us the honor of electing our delegate, Mr. Harry Fowler, as a member of its council. The question of appointing delegates to the conference of this year will be laid before you."

The reports of Secretary Tremper and Treasurer Quantin, showed the society to be in fine working order, and ready to begin the new year in even better shape than before. The present membership is 86, of which 73 are active and 13 are corresponding.

The officers for the ensuing year were then elected. *President* FRANK LA MANNA was re-chosen by acclamation, and the following were unanimously elected: *Vice-President*, W. P. WINTRINGHAM; *2d Vice-President*, WILLIAM ARNOLD; *Corresponding Secretary*, HARRY S. FOWLER; *Recording Secretary*, HERMANCE TREMPER; *Treasurer*, EDWARD H. QUANTIN; *Curator* and *Librarian*, GEORGE S. WHEELER; *Council*, J. MERRITT, M. D. G. POEY, T. B. MILLS, H. ALLEN SMITH and R. N. DENISON.

President La Manna accepted his re-election with a neat speech, thanking the members for their confidence in him and promising many good things in the future. The meeting then resolved itself into a social session, during which many interesting topics pertaining to photography were discussed.

MONTREAL CAMERA CLUB.

THE first public exhibition of lantern slides, the work of members of this club, was held at the Natural History Rooms, February 13th, and was very well attended. After a short address from the President, Mr. Henderson, the lecturer, Mr. L. O. Armstrong, in his usual bright and entertaining manner, described the various slides as they appeared upon the screen, to a most appreciative audience. The slides were, with the exception of a few shown at the end of the lecture, entirely the work of the members of the club, who may be congratulated upon the favorable comparisons made between their work and that of professional experts in the art of lantern-slide making. Among the slides deserving of especial mention were "The Bathers," "Studies of Oxen," "Engineers' Camp in the Rockies," "Surf off Cape May," "Rocks on Mingan Islands." The club authorities have almost concluded negotiations for the lease of large and comfortable rooms in the new Y. M. C. A. building, where members may meet and work; and it is hoped that the use of these rooms and the dark room attached will be an inducement to many amateurs to join with the present members in their effort to establish a photographic club here, which shall compare favorably with the many others existing everywhere in the Old and New Worlds.

Bibliography.

PHOTOGRAPHISCHER ALMANACH UND KALENDER FUR DAS JAHR 1891. Dusseldorf: E. Liesegange's Verlag.

This excellent little German annual comes to us again filled with many good things photographic. In the space of 184 pages are to be found articles by such men as Dr. Schnauss, Dr. Lohse, Eugene Himly, Friedrich Müller, W. Cronenburg, H. Kirchoff and many other writers whose names are familiar to readers of photographic literature. The embellishment of the volume consists of a fine lichtdruck of Frank Veress, the Austrian photographer who recently produced some very interesting results in photography in colors; also another lichtdruck of a view near Cronenburg, and a zinc etching in half-tone of another view at Donauworth.

BIBLIOTHECA POLYTECHNICA. A Directory of Technical Literature. By Fritz V. Szczepanski, St. Petersburg. New York: The International News Co.

This is a classified catalogue of all books, annuals and journals published in America, England, France and Germany, and related to legislation, hygiene and daily life. It has been compiled with great industry, and is a complete list of all publications of value in technical literature in the above languages.

The catchwords are given in English, French and German, so that readers of every nationality can at once turn to the branch that interests them in the literature of the latest investigations. An exhaustive enumeration of the technical journals in the three great languages of the world is also given.

The work is carefully printed, and we recommend it to our readers, as they will find it a very useful little volume.

FOTOGRAFISK TIDSKRIFTS ARSBOK, 1890; utgiven af Albin Roosval. Stockholm: R. Blaedel & Co.

This is a little annual from Sweden, and is a very commendable effort of the industry and enterprise of our confrères in the North. It is

illustrated with seven plates, two of which are lichtdrucks of fine execution, one is an excellent aristotype, and the others are half-tone plates of the best character. Our Swedish readers may feel proud of this production of their countrymen.

LA PHOTOGRAPHIE AERIENNE, par Cerf-Volant. Par Arthur Batut. Paris: Gauthier-Villars & Fils, 1890.

The little volume of 65 pages before us is a terse explanation of the methods pursued in the application of instantaneous photography in ballooning work. The volume is illustrated with a fine gelatine print from a negative taken at a height of 90 meters above the earth.

L'ETUDE SUR L'HYDROQUINONE. Par M. H. Reeb. Paris: Gauthier-Villars & Fils, 1890.

A small pamphlet of 11 pages, giving the results of experiments on the reducing power of hydroquinone, the influence of alkalies and their carbonates on the results when used with a given quantity of the reducing agent; also the quantity of sulphite of soda necessary and sufficient for the perfect action of the hydroquinone. The work seems well done and worthy of study.

MANUEL D'HELIOGRAVURE. Par M. G. Bonnet. Paris: Gauthier-Villars & Fils, 1890.

In the space of 111 pages the author describes the methods employed in the production of positives by the various processes best suited to the preparation of heliogravure and photogravure printing plates. The processes noticed are gelatino bromide, tannin, collodio-chloride, and the carbon methods.

The practical part of the volume is well written, and is apparently from the hand of one who is acquainted with the methods given. Two handsome plates illustrate the volume: one a fine portrait of a little child, and the other a view, both of which are good examples of this kind of work.

PHOTOGRAPHE VITRIFIÉE SUR EMAIL. Par Garin et Aymard. Paris: Gauthier-Villars, 1890.

In the preface to this small pamphlet of only fourteen pages the authors say: "This little treatise might be much longer, it might be more complete, it does not contain what is necessary, but it contains all that is necessary."

It is a small but very complete little set of directions for the practical worker in vitrified photographs and all those operations that use photographs that are burnt in, such as the decoration of porcelain, enamels, etc.

A CYCLOPEDIC INDEX TO THE AMERICAN ANNUAL OF PHOTOGRAPHY. By Professor Charles Ehrmann. New York: Scovill & Adams Co.

As the name implies, this is a more detailed index to the well-known "American Annual." It appears to be carefully compiled, and will prove useful to all those who possess that volume.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—R. S. P. writes: Will you kindly favor me with the formula for reducing samples of silver-paper clippings and precipitates from hypo baths in order to get them into silver nitrate? Can you mention any book on the subject?

A.—The process for the reduction of silver wastes is too long for these columns; we therefore recommend the consultation of "The Dictionary of Photography," published by the firm of E. & H. T. Anthony & Co. On page 160 will be found a complete method for the purpose.

Q.—E. D. G. writes: Please reply to the following questions in the BULLETIN: 1st. Is albumen obtained from any other source than eggs and blood? 2d. How is albumen crystallized, *i. e.*, the process?

A.—There are no other important sources of albumen besides the ones you mention. Occasionally small quantities of the albumen of milk is saved in making milk sugar, but this is of rare occurrence. We have never heard that albumen could be crystallized by any known process.

Q.—C. A. B. writes: Please give me a formula for making sensitized gelatine, to be used in making zinc plates for illustrating newspapers? Also tell me where I can obtain the zinc plates? Or can you tell me how to make the zinc plates?

A.—The method of engraving on zinc has been very fully described in "The International Annual" for 1888, page 377, and is too long a process to be repeated here. This volume can be obtained by applying to our publishers. They will also supply all the necessary materials.

Q.—J. L. writes: Please refer us to one of your publications containing a method for enameling albumen prints?

A.—See BULLETIN of 1888, page 383.

Q.—O. T. D. writes: I put a lump of alum into my bath of silver and filtered it. The filter worked slow, and some of the alum went into the bath, and an equal amount of crystals were thrown down. The bath did not stand at the former test, having lost about 15 grains.

Why was this, and how could I have corrected it? Also does freezing throw down the silver?

A.—A small quantity of alum will not precipitate the silver bath unless it contains albumen, and we cannot understand how it would act on the bath in your case unless the alum was impure. Freezing would cause a deposit of nitrate of silver if the bath was very strong.

Q.—O. La R. writes: Where you have to use well water that is hard for washing prints, is there any way of softening it, so as to improve the washing? Also, what is your opinion of magnesium chloride for fixing prints?

A.—Add to the water some carbonate of soda till it will not give a further precipitate, and be careful not to add too much. After a few experiments, you will find out the amount necessary for a given volume of water. This will serve as a guide for future work, and it is then only necessary to add an amount that is a trifle less than the calculated quantity to secure a good soft water for all purposes. We cannot recommend the salt you mention for fixing; it is slow, and the prints are liable to become mouldy.

Views Caught with the Drop Shutter.

Wilson's Photographic Magazine, in two handsome volumes, for the year 1890, comes to our table. We tender Dr. Wilson our best thanks for kindly remembering us, and hope to see many more such volumes edited by him.

Albuquerque, N. M.—A small trunk containing a photographer's outfit exploded February 9th, while being transferred from the Eastern train to the El Paso train. Richard Centsy had hold of the trunk at the time, and was badly cut over the body, face and head. Fred Hand and George Miller were badly hurt. The car was blown into kindling wood.—*N. Y. Press.*

Mr. Cleaveland A. Chandler, formerly photographic editor of the *Boston Globe*, recently gave us a call. He is now private secretary to Mr. Arthur A. Towle, the managing editor of the *Globe.*

Richmond, Va., February 19th.—Judge Leake, of the Richmond Chancery Court, today decided that photographers cannot expose in their windows photographs taken by them except with the consent of the persons interested. The case is a novel one, and the first of the kind passed upon by a Virginia court.

The history of the case, briefly, is this: Davis, a Broad street photographer, some time ago sold to a florist a lot of rejected negatives which he wanted to use to cover his hothouse. Foster, another picture-taker, bought 400 of the negatives from the florist, and from these printed photographs and exposed them as specimens in his gallery in Ninth street. Davis obtained an injunction to prevent Foster from so using the negatives, and the court made permanent the injunction. —*N. Y. Times.*

D. C. Pratt & Son, the photographers of Aurora, Ill., had their studio destroyed by fire on February 12th. Forty-five thousand negatives, the accumulation of forty years, were in the studio, but the bulk of them were saved. The loss is estimated at $3,500; insurance, $2,100.

TABLE OF CONTENTS.

Evening Post Job Print, N. Y.

NEGATIVES BY W. E. HOOK, MANITOU SPRINGS, COLO.

PRINTED ON N. P. A EXTRA BRILLIANT PENSÉ ALBUMEN PAPER.

PIKE'S PEAK, ROCKY MOUNTAINS.

— SERIES 1. —

NEGATIVES MADE ON

ANTHONY'S CLIMAX NEGATIVE FILMS.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. MARCH 14, 1891. No. 5.

HYDROQUINONE VERSUS EIKONOGEN.

WE have noted lately a considerable amount of discussion in the foreign journals about the relative merits of hydroquinone and eikonogen. Two French experimenters, Balagny and Reeb—the former on hydroquinone, the latter on eikonogen—have been making quite a number of tests that are of special interest to the working photographer.

Balagny says that he has been using hydroquinone for two years, and has found its reducing power so great that he has not had to abandon it once since he has studied it. But he also says that the first formulas given when the hydroquinone was introduced caused two difficulties: first, the bath soon became brown and stained the negative; and second, the development with a new bath produced hard negatives. After experimenting on these difficulties M. Balagny has come to the conclusion that the carbonates of the alkalies are responsible for the color of the negative, especially sodium carbonate, while the hardness of the results are due to alkaline carbonates generally. To overcome these defects he recommends the use of caustic potash as an alkali. The formula given consists of two parts, as follows:

SOLUTION NO. 1.

Sodium sulphite	250 grams.
Water	1000 c.c.

Dissolve with heating and add

Hydroquinone	20 grams.

SOLUTION NO. 2.

Potash (by lime or by alcohol)	100 grams.
Water	900 c.c.

After solution is complete, add the following mixture, which is best made with heat:

Potassium ferrocyanide	50 grams.
Water	100 c.c.

This last gives softness and preserves the whites.

It is also well to have on hand a 10 per cent. solution of potassium bromide. The method of using these solutions is as follows:

For a plate 13 x 18 centimeters (5 x 7 inches) take:

Solution No. 1 (hydroquinone)	80 c.c.
Bromide solution	1 "
Water	40 "

This constitutes the developing bath for instantaneous exposures.

The above mixture is poured over the plate in the developing dish, and allowed to remain till the film is thoroughly soaked, say thirty seconds. The fluid is now poured out of the dish into another vessel and 2 c.c. of the potash solution No. 2 are added, and the mixture returned to the plate in the dish. Allow the fluid to act on the plate a few seconds, to see if the image will appear. If the image does not appear add another 2 c.c. of the alkali and wait again for the appearance of the image, adding the solution in this manner until the picture just begins to appear; the development will now proceed without further additions. As a means of bringing out the last details in the shadows, 2 c.c. of the alkali solution may be added when the development appears complete to the eye.

The bath given above will develop one dozen negatives, if care is taken. After use the bath should be returned to the bottle, and the latter carefully closed for exclusion of air. To start the development of a new series of instantaneous exposures, a bath may be made as follows:

Bath already used	60 c.c.
Solution No. 1	60 "

The addition of bromide is not necessary, as the bath contains enough from the former development. But Solution No. 2 must be added with the same care as before, using only 2 c.c. at a time until the high-lights begin to appear. This last bath will answer for a new lot of exposures.

For time exposures the bath is made up as follows:

Solution No. 1 (hydroquinone)	40 c.c.
Bromide solution	4 "
Water	80 "

The method of using is exactly the same as with instantaneous exposures, always searching for the limit of development, the additions of No. 2 being always 2 c.c. at a time.

Working in a somewhat different line of research, M. Reeb has determined, by a series of careful experiments, the best proportions to mix the hydroquinone with sulphite of sodium and potassic hydrate to give the most satisfactory results in development. For this purpose he determined the actual reducing power of hydroquinone upon a given quantity of silver oxide, also the best quantities of alkali or alkaline carbonate to use under these conditions, and at the same time the quantity of sulphite of sodium for the best working of the developer.

Taking silver nitrate as a standard he found that 0.08 grams of hydroquinone would reduce 1 gram of the salt.

In the case of sulphite he found the use of too much was injurious, and finally came to the conclusion that the following proportions are the best to use:

Hydroquinone and Potash.

Hydroquinone	1 gram.
Potassium hydrate	4 "
Sodium sulphite	7.5 "

Hydroquinone and Carbonate.

Hydroquinone	1 gram.
Sodium carbonate	10.5 "
Sodium sulphite	5 "

If other alkalies are desired they may be used in the following proportions:

Sodium hydrate	2.85 grams.
Potassium carbonate	4.92 "

To be used with 1 gram of hydroquinone.

Applying the same set of tests to eikonogen, M. Reeb found that 1 gram of silver nitrate requires 0.33 gram of this developer to completely reduce it, together with the same quantities of the alkalies found necessary for hydroquinone. As with the last compound, sulphite of sodium affects the development within certain limits. A mixture of sulphite and eikonogen without alkali will have some reducing power, but the action will be slow.

Using the sulphite as a preservative of the eikonogen, five parts of the salt are needed for one part of eikonogen. If, on the other hand, an alkali is used, this amount is increased to ten parts.

Commenting on the results obtained in these experiments, M. Reeb comes to the conclusion that hydroquinone is better than eikonogen, and he gives the following formulas for comparison.

To reduce 1 gram of silver nitrate using hydroquinone, the following proportions are required:

Hydroquinone	8 grams
Potassic carbonate	40 "
Sodium sulphite	40 "
Water	1,000 "

Using eikonogen, 1 gram of silver nitrate requires:

Eikonogen	33 grams
Potassic carbonate	40 "
Sodium sulphite	300 "
Water	1,000 "

It will be noted that in the last formula there is four times the amount of eikonogen that there is hydroquinone in the first. In the last formula the sulphite is eight times that used in the first.

M. Reeb acknowledges that hydroquinone is slower than eikonogen, but only under the ordinary conditions and not when used properly. As a rule its action is retarded by the use of too much sulphite.

Drawing our own conclusions from the above-mentioned results of both experimenters, we should say that the developer of Balagny, with a reduction of the sulphite to 150 grams, would prove the most desirable to use, and his method of development is one that we can strongly recommend from our own experience. The use of ferrocyanide was advocated by Captain Eugene Himly in the "International Annual" several years ago, and Dr. Eder and Professor Lainer, of Vienna, have confirmed his results quite recently.

When the question of economy is of no importance, a mixture of hydroquinone and eikonogen will be found very effective, but the hydroquinone alone is only a trifle behind it when used with potassic hydrate.

Now is the time for the amateur to experiment with developers, and not wait till the fine weather comes. For him we would strongly recommend an attack on the hydroquinone and eikonogen question on the above lines.

EDITORIAL NOTES.

We record with pleasure the fact that Lieutenant-Colonel J. Waterhouse, B.S.C., of Calcutta, has been awarded the progress medal of the Photographic Society of Great Britain for 1890.

The Toronto Amateur Photographic Association held a smoking concert on the 27th of last month at their rooms, which was much enjoyed by the large number of members and their friends who were present; beside the music and refreshments which were served, a number of slides were exhibited, and some exhibitions of fencing and single stick exercise tended to make the evening a very enjoyable one.

We understand that the Yonkers Camera Club have secured a fine new suite of rooms in Hawthorne Hall, which is more central and much more commodious than their former location, and that the rooms will shortly be furnished and ready for occupancy.

Owing to the increasing demand for back numbers of the Bulletin, the publishers are unable to fill all demands, and a copy of No. 1 for 1889 is now wanted which cannot be supplied. If any of its readers have a spare copy of this number full price will be paid for it; we shall be glad to hear from any one having this number to dispose of.

The Syracuse Camera Club gave a most enjoyable entertainment on the 13th ultimo, on which occasion they entertained Professor Spencer B. Newbury, of Cornell University. A number of slides from the Pacific Coast Amateur Photographic Society were shown, and also a large collection by Professor Newbury of views made by himself at the Paris Exposition, and many in the picturesque neighborhood of the university. The club is rapidly growing and in a remarkably healthy state.

The Photographic Section of the Scientific Association of New Britain, Conn., gave an interesting lantern-slide exhibition on February 16th last, and have arranged for a regular course of lectures by prominent speakers, to take place in the immediate future.

G. Bani gives the following as a new bath for toning gelatino-chloride paper:

Benzoate of soda—produced from the acid	20 grams.
Caustic potash	0.1 "
Water	450 c.c.

Add to this 50 c.c. of—

Solution of brown gold chloride	1 gram.
Water	150 c.c.

Stir and allow to stand for about two hours, when it will take a rose color and is ready for use. The tones obtainable with it are said to closely resemble those with the platinum toning bath.

The Council of the American Photographic Conference announce that, owing to lack of time, there will be no exhibition of prints this spring. A

monthly journal is to be published by the conference. Applications have already been received from twelve clubs for membership.

THE following method has been suggested for removing the yellow stain from negatives caused by prolonged development.

Hyposulphite of soda	1,000 grams.
Water	4,000 c. c.

To which is added—

Sulphocyanide of ammonium	120 grams.
Powdered alum	30 "

This is allowed to stand for several days, being often stirred, after which add 150 c.c. of a chloride of gold solution, 1:200. This solution is than decanted to get rid of sediment and the stained negative soaked in it for a half hour, when the color will be found of a beautiful violet-black or gray-blue tone, finely adapted to printing.

WE would acknowledge with thanks, the receipt of invitations to the first exhibition for 1891 of the California Camera Club, on the 26th of February. The subject of the evening, "The Yosemite Valley," and the exhaustive list of slides to be shown make it a matter beyond doubt that the distance prevented our experiencing an evening of great pleasure. A number of entertainments of a high order of merit are announced in the future, and members of the club are to be congratulated on the many facilities for entertainment and instruction which are placed at their disposal.

IT is said that the sensitiveness of gelatino-bromide plates may be increased fivefold by immersing them for from three to five minutes in the following solution:

Alcohol (80 per cent.)	100 c.c.
Solution of nitrate of silver in water (1:15)	1 to 2 c.c.
Ammonia	10 c.c.

After drying, they should be used at once.

ATTENTION has recently been drawn by a German writer to the large and bewildering number of different names given to the various processes in use on the other side for the illustrations of books, he mentioning no less than twenty-eight, of which only a very few could be distinguished by any but experts as differing from many of the others, except in name. That the same fact obtains in this country, and oftentimes to the disadvantage of the publisher, is not to be denied.

WE are in receipt of some very fine specimens of work on plain paper (mat surface) from the studio of Mr. B. L. H. Dabbs, of Pittsburgh, which are of great merit. The posing, lighting and development show a fine sense of the artistic, and the tone of the prints is something not often equaled. The collection reflects credit on the studio from which it came, and adds another argument in favor of this style of printing.

A PROJECT is on foot in England to establish a Photographic Institute, and with that in view the Photographic Society of Great Britain have issued

circular letters to the various societies and clubs of a photographic nature, asking their opinions and support. The Lord Mayor of London has been interested in the project, and if the support of provincial and metropolitan societies can be assured, it is more than likely that the movement may be aided by the Government.

A PHOTOMICROGRAPHIC laboratory, for the preparation and publication of reproductions of a photomicrographic nature, has been established by Count R. Sernagiotto, at Rimini, and some fine examples have already been issued.

THE Photographic Society of Waterbury, Conn., is in a state of rapidly increasing prosperity and success. It is only about two years old, but it has a large and commodious meeting-room, which is well arranged and fitted for the uses of the society. A set of lectures and slide entertainments has been laid out for the balance of the season.

SINCE our last issue we have seen a copy of the flash-light picture, made by C. F. Conly, of the audience in the Park Theater, Boston, on a recent occasion. The evenness and amount of illumination are quite surprising, and the picture is one of the nearest to a complete success of any that we have seen of this nature.

A NATIONAL exposition in the interest of the health and education of children, is to take place in Milan from March 15th to April 15th, at which one of the features will be photographic apparatus, and another, magic lanterns for children.

FROM April 13th to May 2d a national photographic exhibition and series of optical lantern entertainments is to be held in the Crystal Palace, London. A gold medal and many handsome prizes are offered for the best exhibitions, and no pains spared to make it unusually attractive. Communications may be addressed to Henshaw Russell, Manager, Crystal Palace, Sydenham, S. E., London.

M. LIPPMANN, whose researches in color photography have caused so much interest of late, in announcing his discoveries to the Paris Academy, says that the two conditions necessary to success are a sensitive film free from grain and a reflecting surface behind it. For this latter, he uses a hollow dark slide filled with mercury and places the film in front; it is then exposed and developed as in the ordinary process. The incident light, forming the image in this way, interferes with the reflected light from the mercury, and the result is a succession of waves of luminosity produced upon the film, differing according to the amount of light reflected upon the mercury by the varying colors of the object being photographed. Mr. Lippmann's investigations in this direction are most valuable and important in a scientific way, but the colors are evidently due to the same cause as those found on the surface of soap bubbles or thin films of oil—interference of light.

UPON the walls of the reading-rooms belonging to the Society of Amateur Photographers of New York, is to be found some very artistic work. None more so than the work of Mr. C. H. Davies. Mr. Davies is an artist by pro-

fession, and in his photographic studies here on exhibition he has applied his artistic knowledge with the result of producing a frame which should be well studied by every photographer, professional and amateur. Using the well-known Seavey backgrounds, arranged with such skill that, while subservient to the principal figure, they make the study a picture, Mr. Davies shows us studies in portraiture at its best. It is hard to particularize; they are all worthy of thorough examination.

THE AMATEUR AS A SPECIALIST.

BY ADELAIDE SKEEL.

"An old looking-glass. Somebody finds out the secret of making all the images which have been reflected in it pass back again across its surface."—*Hawthorne's Note-Books.*

To-day, the secret of the reappearance of images on a sensitized surface is an open one in photography, yet I think too many of us are vainly trying to make everything we see pass back again into plates and leave us its developed shadow. I mean we attempt to take too many different things, and as a result get but indifferent success. In a recent "annual" there was a plea for specialists in our art, and amateurs were particularly urged to devote their leisure to some one single endeavor. The writer's view was a wide one, and he suggested the special study, not only of mechanical accessories, but also the more thorough investigation of commercial chemistry and spectrum analysis. I ask a less wide range in proposing that beginners like myself should confine their attention for six months at least to one class of subjects. Photography, as I take it, is generally understood to be a writing in light—not a study of ways and means, but an end. Lenses, shutters, plates, developers, are the channels, the pipes which carry the gas, the wires which bring the electric current. I am glad any one takes the trouble to find out how to use the photographic means, but I am more interested in what I take than the how and why of taking it. Again, on the choice of subject, many people take all they see—and if good-natured all their neighbors see—till the plates are gone, and they have a heterogeneous museum of views. Now, would it not be better, in this new year, to heroically decide to give one's great or little talent, one's ample leisure or scanty holiday time, to some particular line of thought? We have only to look at the unqualified success—compared with amateurs—that the professional achieves in the portrait line, to which he usually gives his undivided attention, to be sure that the way to get ahead is to keep along one path. As a teacher in an English literature class said when asked to plan out a course of reading: "If you are interested in anything read about it, and one book will lead you to another." So if one is interested in any particular subject, or has had some small modicum of success, let him follow it up on the same line. Time and money will both be saved if one concentrates, for a while at least, on a special branch, be it portraits, interiors, landscapes or animals. One kind of shutter, one make of lens, one brand of plate, one style of camera, will usually suffice; and if by skill or luck one happens to make a great hit while working on one class of subjects, the temptation to return to indiscriminate view-taking will be lessened, while the desire to reach technical perfection will be stimulated by each successive effort in a single direction.

Images will continue to cast their passing reflections upon our magic mirrors

till we reach the land where Dante tells us ghosts throw no shadows; but since even the most industrious button-pressers may not catch them all, let us content ourselves with making a special study of a few of one kind.

INTENSIFICATION.

BY CHARLFS L. MITCHELL, M.D.

[Read before the Photographic Society of Philadelphia.]

In presenting to the society this evening these few notes on intensification, it is not my intention to offer anything new, but merely to call attention to some of the most important details of an old and well-known process—namely, that with mercury and sodium sulphite.

It has been tacitly considered by many photographers that the practice of intensification is a rather reprehensible one, and not to be depended upon for satisfactory results. Yet it should be an orthodox and thoroughly reliable method of procedure. In the days of wet-plate photography intensification with acid pyro and silver was a routine part of the process; now, in the days of rapid plates and thin, soft negatives, full of detail but lacking in density, a reliable method of intensification is just as much of a necessity, and often required. The following method, therefore, many of the details of which were elaborated by Mr. John Bartlett (a member of this society), can be depended upon to give certain and satisfactory results in every case. The details are as follows:

The negative (film or glass) should, after fixation, be thoroughly washed and then dried. The dry negative is then placed in a suitable dish, film side up, covered with clean water, the face swabbed over thoroughly with a tuft of absorbent cotton to remove air bubbles, allowed to soak for a few minutes, and then the water poured off, and sufficient of the following solution poured on to cover the plate. The solution is composed of:

Citric acid	60 grains.
Perchloride iron (dry)	60 "
Water	1 pint.

This is kept in constant agitation over the plate for about a minute, and then returned to its bottle, and the plate washed under a running stream of water for about five minutes. This solution can be used repeatedly for a long time before becoming exhausted. Its use is twofold: it tends to remove any thin film of fog upon the surface of the negative, and also furnishes a groundwork for the subsequent deposit of mercury. The plate is now bleached by being placed in the following solution:

Mercury bichloride	½ ounce.
Common salt	½ "
Water	1 pint.

The plate must be frequently rocked while in this solution, and allowed to remain in it until sufficiently bleached. This is regulated by the amount of intensification required. If considerable density is desired, it must be allowed to remain until quite white. This solution is then to be poured off, and can be either thrown away or used for several more plates; the best results are obtained, however, by using fresh solution for each negative. The plate is next covered with a sufficient quantity of the following solution:

Common salt	2 ounces.
Water	2 pints.

This is allowed to remain on the plate for about a minute, then poured off and thrown away, and the plate well washed under the tap for about five minutes. The object of the salt is simply to dissolve out any mercuric chloride remaining in the film, and prevents the clear portions of the negative from becoming clogged up with any reduced mercury in the next operation. The plate is now returned to the dish, and a sufficient quantity of the reducing solution poured on it to just cover it. This is made as follows:

Sodium sulphite, cryst	3 ounces.
Acid sulphuric, conc	2 ƒ drams or ½ ounce by weight.
Water	1 pint.

The sulphite is dissolved in 12 ounces water, allowed to cool, and then the acid previously mixed with 4 ounces water added. I should say just here to those not familiar with chemical manipulation that in mixing sulphuric acid and water the acid should always be poured gently and in small quantities into the water, not the water added to the acid, as in the latter case, owing to the violence and heat of the combination, some of the acid might be thrown into the face of the operator.

As soon as the reducing solution is poured on the plate it commences to turn brown and then black. The operation is completed when the back of the plate is perfectly dark, showing no traces anywhere of the whiteness caused by the mercury. The negative should then be perfectly bright and clear, and of a brilliant bluish-black color. It is then to be placed under the tap, washed for five or ten minutes to free it from all traces of sulphite, swabbed off with a piece of cotton, and set up in a rack to drain and dry. The reducing solution can be used several times, until it becomes exhausted, and is then thrown away. It should never be returned to the original stock bottle. This process can be depended upon to yield in every case good and satisfactory results, and the intensification produced is perfectly permanent in character. The main points to which attention must be directed in order to secure good results, are these:

1. All solutions used must be filtered, clear and free from specks.

2. The negative must have been previously well washed, so as to thoroughly remove all traces of hypo.

3. The negative must be moistened before the solutions are poured on, so that they will act evenly and uniformly on the plate.

A negative can, if necessary, be intensified immediately after development, fixation and washing, without being allowed to dry, but in this case the density obtained will not be so great as if the plate had been previously dried.

[*From Deutsche Photographen-Zeitung.*]

A WORD ABOUT ARISTOTYPY.

BY G. MERCATOR.

THE winter is a bad time for the photographer. The public has no consideration for rain or sunshine, for a dull, cloudy day, or a bright, clear sky. They simply want pictures. This is particularly felt during the holidays.

Our albumen paper is a good printing material not to be despised, but it requires good negatives, bright light, uniform temperature, and a good many other things which cannot always be had during the winter months.

We have therefore to look for a suitable substitute. Such a medium has long been discovered, but, we regret to say, has been introduced so little that it disappears almost in the quantity of albumen paper used. It is the chloride of silver collodion paper.

The experiments to adopt the collodion, formerly used exclusively for the negative process, also for the positive process date back some time. But the composition of the emulsion and the preparation of the paper offered so many difficulties that good results were scarce, and could be obtained only by experienced hands. But the friends of this process worked with indefatigable zeal toward the completion of the same, and to-day, after difficulties and obstacles have been surmounted, it can be applied with the greatest facility.

The process is oftentimes erroneously called "aristotypy." The aristo paper is a chloride of silver gelatine paper, having in common with the chloride of silver collodion paper only the chalk—or baryta—ground.

The advantages of the chloride of silver collodion paper in comparison with the albumen paper are essentially the following:

1. Greater sensitiveness to light, and, as a result, quick printing, with fine delineation of details.

2. Insensibility to a quick change of temperature.

3. Easy, sure and uniform toning, with a simple, durable bath in every desired shade.

4. Quick and thorough washing.

5. Easy retouching and coloring, and high gloss, with or without burnishing.

6. The durability of the prints is unsurpassed.

With regard to Number 1, the manner of the printing process is a peculiar one; the paper prints softer than aristo and harder than albumen paper. It unites the advantages of both papers without showing their defects. Aristo paper shows too much hardness, and requires therefore a soft negative, albumen paper prints softer and requires therefore a more intense negative. In consequence of its flexibility it lays even and flat, avoiding folds and wrinkles, and can just as well be printed with the aid of clothes-pins as in the printing-frame. The surface is bright and glossy, and shows the greatest similarity to aristo paper.

Of all evils in the collodion process, the toning has always been the greatest. The prints would either not tone at all, or so uneven and spotty that they could not be used, the curling of the paper driving the operator often to desperation. Good collodion paper of to-day shows almost no tendency to curl, and the toning process with the slightest attention proceeds as even and uniform as could be desired. Every shade from brown to deep black can be obtained; such a strong over-printing, so indispensably necessary for aristo paper, is not required; a fading of the tone in the fixing bath does not take place. But it is by all means necessary to wash the prints well before toning, to prevent any adherence of chloride of silver. A good gold bath is one with acetate of soda or ammonium sulphocyanide.

The washing after fixing in running water is finished in about half an hour. The very thin collodion film is hereby liberated completely from the soda, while gelatine films will retain the fixing salt with great tenacity and require a prolonged washing.

The burnishing is done in the usual way, and furnishes almost no waste. Larger sizes can easily be enameled by squeegeeing the picture with the film quite

wet carefully upon a polished glass plate. The paper is left to dry a little; then the plate is heated pretty well, and the paper will come off with a high gloss.

The durability of chloride of silver collodion pictures is much greater than that of albumen pictures. This thin film is not hygroscopic, and the chalk ground prevents the entering of injurious gases from the paper film. They are also much less affected by direct sunlight, thereby keeping their whites and freshness much longer. The disappearing of the gloss after mounting does not happen.

If this paper, notwithstanding its great advantages, has met with so little introduction, it has doubtless its foundatión in the prejudice and general belief that the process is too expensive. But this is by no means the case. Aside from the saving of time, money and waste (the cost of a cabinet picture being about 8 to 9 pfennigs), the result speaks for itself.

The home preparation of the paper is to be recommended, but not that of the collodion emulsion. It requires too much routine and a thorough knowledge of the material. A foggy emulsion produces only waste; time, money and enjoyment are lost, and the process is in discredit. The collodion is prepared and bottled in a way that it will keep for years, and we can therefore recommend to all aspiring photographers—in their interest and that of their customers—to try the chloride of silver collodion paper.

[*From Photographisches Wochenblatt.*]

EMULSION PLATES WITHOUT GRAINS.

BY J. GAEDICKE.

All dry plates generally in use give negatives in which the picture consists of grains of silver of greater or less dimensions. The size of the grain grows with the sensitiveness of the plate. Over-ripe emulsions give such a large grain that they may become useless for portrait purposes. In diapositives made by contact for enlarging purposes the grain appears still coärser.

The necessity has therefore been felt for some time for an emulsion without grain; and to remedy this the writer produced a bromide of silver emulsion in a totally unripe condition, whereby the purpose was attained.

The pictures obtained with this emulsion will show no grain through the strongest microscope. When enlarged five hundred times a grain is first partly visible, but still embedded in a colored, apparently structureless mass.

This emulsion shows the peculiar property that it can be developed in different tones, according to certain additions made to the developer. It can be developed in green-black, Indian red, sepia-brown, in colder or warmer tones, and it may be transferred even in a sulphocyanide gold bath through warm brown into violet, even to blue, with undoubtedly valuable results for practical purposes.

The sensitiveness, corresponding with the absence of grain, is a proportionately moderate one to highly sensitive dry plates. But another property makes amends for this, namely, that over-exposure is hardly possible.

Over-exposure to such an extent that ordinary plates would become useless can take place without the picture suffering in the least.

The plates are almost transparent and as polished as glass, so that the film side can only be recognized when a moistened finger, with which a corner of the plate has been touched, adheres to the film side. It will not do this on the glass

side. Corresponding herewith the picture is also very transparent, but has an extreme covering strength even in the most delicate tones.

The sensitiveness was determined sensitometrically and compared with the most sensitive dry plates, whose time of exposure was taken as a unit. A forty times exposure gave a strong picture, which at an eighty times and two hundred and forty times exposure grew gradually softer, and the best result gave a six hundred times exposure with short development.

Exposure.—Diapositives are exposed in a printing-frame under an ordinary negative in diffused daylight, according to the density of the negatives and the intensity of light, from six seconds to six minutes.

Development.—Although iron and pyro-developer might be applicable in diluted condition they cannot be recommended, because the tone to be obtained would not be satisfactory. For the grainless emulsion we can therefore recommend only the hydroquinone-potash developer, which has to be diluted with water. Dilute 40 c.c. of hydroquinone developer with 20 c.c. water, and make the following additions to this mixture for the production of different tones:

a. For green-black—3 drops of bromide of potassium solution 1.10.

b. For cold sepia tone—2 drops of bromide of potassium 1.10, and 20 drops of nitrate of ammonia solution 1.10. The exposure should be so arranged that the development lasts only from one to one and a half minutes.

c. For warm sepia tone—3 drops of bromide of potassium 1.10, and 40 drops of nitrate of ammonia 1.10. Duration of development one to one and a half minutes.

d. For Indian red color—1 drop of bromide of potassium 1.10; 40 drops of nitrate of ammonia 1.10, and 4 drops of liquid ammonia. Expose so that the development does not last longer than half a minute.

Fix as ordinarily with hypo. The final end of the process is easily recognized by the disappearance of the opal-like shine on the reverse side.

If pictures developed according to formulas *b*, *c* and *d* are not fixed in hypo, but are placed in a sulphocyanide gold tone fixing bath, they will assume in the course of from thirty to forty minutes a violet tone, which darkens considerably during drying. If they are left in this bath for a longer time, they will finally become pure blue.

By means of this gold bath the whole tone scale from yellow-brown through all the brown tones to violet can be produced, which is of importance in the production of lantern slides and glass stereoscopic views.

Diapositives for enlargements or reproduction of negatives are developed according to Formula *c*, and are toned violet.

Duplicate negatives are made by contact from a diapositive of also grainless emulsion, because the same gives greater fineness than dry plates.

To determine the printing capacity of the different tones, three duplicate negatives were produced from a diapositive: I. With development *a*, green-black; II. With development *c*, warm sepia; III. With development *c* and tone fixing bath, violet. All these were put out simultaneously on a cloudy day in November. I was not finished in one day and printed altogether fifteen hours; II required two and a quarter hours, and III only two hours. Con-

cerning the character of the pictures I was hard, II was softer, and III the most harmonious and had the greatest details.

The violet negative was touched up with violet ink (aniline) and a fine brush under a reading-glass. This proves that it is best to produce the duplicate negatives in violet color, because they show an extraordinary printing capacity.

Enlargements.—An enlargement was made from a duplicate negative in proportion of 2:7 upon an ordinary dry plate, by burning 1.8 centimeter of magnesium ribbon behind the negative protected by tissue paper. The exposure was a little too strong, so that the development had to be retarded. A Steinheil group antiplanat No. 3 with No. 4 diaphragm was used. The diapositive obtained was retouched, and then a print was made upon grainless emulsion and colored violet, which gave a negative of great strength and printing capacity.

Here the advantage of the violet coloration showed particularly a brown diapositive, developed according to Formula *b*, giving no fully exposed enlargements with 45 cm. of magnesium ribbon upon an ordinary dry plate.

From the diapositive, which was made by enlargement, a print was also made upon an ordinary dry plate, and the negative so obtained was compared with the grainless violet one. But the latter possessed undoubtedly more fineness and gave a much softer picture, more uniform in its several parts.

Direct Views.—It is to be regretted that the lack of sensitiveness of the grainless plates has not admitted yet of any direct portraiture; but for landscapes it can be employed for direct views. A forty times exposure is sufficient, if 60 c.c. of pure hydroquinone developer with 3 drops of bromide of potassium are employed.

This would be an exposure of about ten seconds, when otherwise the exposure is one-quarter second.

The negative becomes thereby harder and richer in contrast than might be advantageous for portraiture, but this is exactly desirable for a landscape negative.

The development, according to Formula *a*, would proceed here a little slow, and might extend from five to eight minutes. The development of the contact prints mentioned before, which do not last longer than one and a half minutes, may be done very well with a yellow glass lantern for kerosene oil or gas. With direct views, where the time of development is somewhat longer, fog would appear, and here the development has to take place in yellow monochromatic light or the ruby lamp.

The several applications of the grainless emulsion plates are the following:

1. In astronomy.
2. In micro photography.
3. For diapositives for enlargements.
4. For duplicate negatives.
5. For glass stereo views and lantern slides.
6. For direct views and landscapes.

EXPLICIT.—Exasperated Property-owner (to organ-grinder): "What'll you take to clear out?"

Organ-Grinder (coolly): "Me takka me time."

[*From the British Journal of Photography.*]

"ODD JOBS."

BY EDWARD DUNMORE.

THE title of this article is intended to convey the idea of work that is not usually included in a general every-day practice, but which at some time or other the photographer is called upon to perform. The most disagreeable of any, in my opinion, is post-mortem photography. What pleasure people can find in looking at the horrid presentments so frequently made is past my comprehension, but such photography has to be done, and it is as well to make the best of it. Setting aside the repugnance most photographers have to the work, the conditions imposed are often trying in the extreme, from a photographic point of view, as regarding the size of the room and quality of the light. The disinclination one has to handle the subject, and the restrictions of a sentimental nature imported into the proceedings by relatives or friends, often hamper the successful performance of this class of work very much. It has to be done, and if the results are to be better than a horrid nightmare we must smother our squeamishness and make the best of it. The following hints may, perhaps, be of some use to those who have sufficiently strong nerves to undertake work of this character. As a preliminary move, ascertain, if possible, the cause of death, which, if of a contagious nature, throw up the job without hesitation; if not, get it over as soon as may be.

Now, the conditions are, generally, that the subject lies on an ordinary bed or in a coffin. The first is the best for the photographer, as with the assistance of an attendant the body may be so arranged that a fairly pleasant picture can be made. One arm can be exposed outside the coverlet, and accessories arranged so that a sleeping figure is suggested. Now, with regard to the lighting, it frequently happens there is very little daylight available, but providing there is a practicable quantity, the results are better with it and a long exposure than with artificial light and shorter. The magnesium or flash light is apt, unless the operator has had considerable experience with them, to produce either flat effects or too much contrast, it not always being possible, by reason of the surroundings, of firing them off to the best advantage. The bed or couch on which the body lies should be wheeled into the best possible position with regard to light and convenience for working. The preliminary preparation of the body ought to be such that the eyes and mouth are closed. If, unfortunately, this has not been properly effected, an improvement may be made by passing a narrow tape under the chin and tying it tightly over the head. With regard to the eyes, they will have to be remedied by the retoucher on the negative. There is considerable reluctance with most people to take any steps of this kind, but the statement will generally, acting under your directions, afford the help. The idea you wish to convey is that of a sleeping person, and no little alteration of this kind should be shirked. A pleasant, life-like appearance is not an invariable result, take what trouble you may, but such precautions will make a much more agreeable picture than if they are neglected. Supposing the subject is already in the coffin, unless the friends desire the surroundings to be included in the photograph (but this is usually left to the discretion of the operator), confine the attention to the face, hiding all traces of the coffin by drapery. The camera should be placed high and pointed down, or the head of the coffin

raised, as the case may be, perhaps both. A view of the face from below is not making the best of the subject, and exaggerates the unpleasant peculiarities at the expense of the more favorable ones. When all is said and done, in nine cases out of ten the portrait is very unlike the living person. We are probably told that this is the only opportunity of getting a portrait of any kind, and it is of no consequence to the photographer; he gets paid, and there his interest ceases.

In most cases a great improvement can be effected by reproducing from the original negative and finishing in black and white. The artist can then, by retaining the likeness, so alter the surroundings that instead of a thing to shudder at it may be made into a pleasant-looking picture, that can be copied and so multiplied at discretion, or reproduced in any way that may be thought desirable. It may be objected that people will not run to the expense. Perhaps some will not, but by distinctly showing the advantages many may be induced to have the improved picture. One very important factor, from a business point of view, is to supply the photographs promptly, as the recollections of the friends of the deceased person soon revert to the remembrance of how they appeared when living, rather than of the short time they were on view afterwards; and every week makes your post-mortem photograph appear less like, and consequently less favorably looked at. We will now leave this gruesome subject, and take another of a somewhat livelier character—that is, photographing buildings, masonry, etc., for legal purposes.

Now this may be quite pleasant out-of-door work, or it may be such that the photographer will hold his breath and rush into the open air at the first opportunity. The place may be dark, damp and full of foul odors, and the inhabitants such that it is an advisable precaution to leave your valuables at home, and have the protection of a policeman. These dark, unsavory subjects have occasionally to be photographed. To do them the apparatus used should be such that can be quickly put up and removed, and no loose pieces to look after, and be provided with means for artificial light. The photographer of the present day has many things in his favor as compared with the old wet-plate days, when such work was almost dangerous. I remember a well-known photographer who was invalided for a fortnight after one of these experiences. Wide-angle lenses are generally necessary, the work being mostly at close quarters. Look to the lens just before use to see that it is not dimmed with condensed moisture, and let the whole apparatus be carefully enveloped in the focusing cloth to protect it from dust, which during the demolition of old buildings is almost suffocating, and will penetrate every unprotected chink and cranny, giving rise to lots of trouble.

It is sometimes necessary to do a little acrobatic performance by climbing over roofs to get a view of the parts required. Before now I have had to lash my camera to a chimney stack to get into a good position. Your assistant should be provided with some rope and a few pieces of board, that often on such occasions come in useful. Some architectural feature may have to be photographed which necessitates the camera being raised to a great height, when a very tall pair of steps may be made available by screwing the camera on to the top of them. You can mount the steps and focus, but it is out of the question to make the exposure standing upon them at the same time, as the vibration would spoil all, even if you could keep your balance. The remedy is to attach

a thin cord to the cap of the lens and to a focusing cloth properly adjusted, open the slide, the cap being very loosely placed on the lens, with the cord hanging down. Descend to terra firma, and when the vibration of the steps has ceased carefully twitch the cap off the lens with the cord to make your exposure, when another pull will draw the focusing cloth over the lens, and so complete the process. The steps can be remounted, the dark slide closed and withdrawn, and the operation is complete, without vibration, and with very little trouble.

(*To be continued.*)

PHOTOGRAPHIC SHUTTERS.

BY FRANCIS BLAKE.

[Paper read before the Boston Camera Club.]

Mr. President and Gentlemen of the Club:

I purpose to call your attention this evening to some results obtained in an attempt to devise and make a perfect shutter for quick photographic exposures, to which attempt I have devoted much of my leisure during the last three or four years. The work has been most fascinating, and whatever success has attended it must be fully shared with my friend and kinsman, and our fellow-member, Mr. John G. Hubbard, who has been my almost constant companion and coadjutor.

At the outset I will say that the word "shutter" will be used throughout this paper, not because I deem it a correct name for the apparatus, but because more than thirty years of bad usage have so fixed it in the photographic vocabulary that it would be Quixotic to try to displace it. Of course "opener" would be quite as appropriate, or rather inappropriate, a name as "shutter"; and of course "exposer" is the proper substitute for both, as its dictionary meaning defines precisely the function of the apparatus.

The earliest mention of shutters with which I am familiar is in a most excellent "Dictionary of Photography," edited by Thomas Sutton, and published at London in 1867.

On page 156, under the heading "Instantaneous Shutters," he says: "There are many methods of instantaneously admitting and shutting off the light from the sensitive plate. Mr. Wilson, who has been most successful in getting good pictures with rapid exposures, adroitly uses his Highland bonnet placed in front of the lens. Some use flap-shutters in front of the lens; some a similar arrangement close behind the lens; and Mr. England and others use a guillotine sort of shutter, with a slot cut across it, which falls immediately in front of the sensitive plate. As the slot passes the plate the parts thus exposed to light receive the full effect of the whole power of the lens. In some respects this is the best instantaneous shutter that has yet been devised, but it is apt to cause a vibration in the camera while in the act of falling."

I have quoted the above because I feel sure that later you will share with me surprise that the principle of the focal plane shutter, so clearly stated by Sutton, should have been entirely neglected by later workers in the photographic field.

Before beginning original work it was thought best to test the speeds of the best market shutters. This was done by means of an apparatus which I devised, and had the pleasure of exhibiting to the Boston Camera Club some years ago. The principle of the apparatus is simply photographing the image

of the sun as reflected by a freely falling silvered ball, and deducing the time of exposure by applying a law of gravitation to the linear value of the distorted image.

My apparatus consists of a vertical staff about 6 feet in height, rigidly attached to an iron bed-plate. The staff is painted dead black, and is graduated downward on its front face in white lines to feet and hundredths. At the top of the staff is a movable piece, readily adjusted to the height which brings the image of the sun as seen upon the surface of the ball exactly in line with the zero of the staff graduation. The silvered brass ball, 2⅜ inches in diameter and 2 pounds, 2 ounces in weight, is suspended by a short piece of silk trout-line attached to a small

	0	1	2	3	4	5	6	7	8	9
1.0	2494	2506	2518	2531	2543	2555	2567	2579	2592	2603
1.1	2615	2627	2639	2651	2663	2674	5686	2697	2709	2720
1.2	2732	2743	2754	2766	2777	2788	2799	2810	2821	2832
1.3	2843	2854	2865	2876	2887	2897	2908	2919	2929	2940
1.4	2951	2961	2972	2982	2992	3003	3013	3023	3034	3044
1.5	3054	3064	3074	3085	3095	3105	3115	3125	3135	3144
1.6	3154	3164	3174	3184	3193	3203	3213	3223	3232	3242
1.7	3251	3261	3270	3280	3289	3299	3308	3318	3327	3336
1.8	3346	3355	3364	3373	3383	3392	3401	3410	3419	3428
1.9	3437	3446	3455	3464	3473	3482	3491	3500	3509	3518
2.0	3527	3535	3544	3553	3562	3570	3579	3588	3596	3605
2.1	3614	3622	3631	3639	3648	3656	3665	3673	3682	3690
2.2	3699	3707	3716	3724	3732	3741	3749	3757	3765	3774
2.3	3782	3790	3798	3806	3815	3823	3831	3839	3847	2855
2.4	3863	3871	3879	3887	3895	3903	3911	3919	3927	3935
2.5	3943	3951	3959	3966	3974	3982	3990	3998	4005	4013
2.6	4021	4029	4036	4044	4052	4059	4067	4075	4082	4090
2.7	4098	4105	4113	4120	4128	4135	4143	4150	4158	4165
2.8	4173	4180	4188	4195	4202	4210	4217	4225	4232	4239
2.9	4247	4254	4261	4269	4276	4288	4290	4298	4305	4312
3.0	4319	4326	4334	4341	4348	4355	4362	4369	4376	4383
3.1	4391	4398	4405	4412	4419	4426	4433	4440	4447	4454
3.2	4461	4468	4475	4482	4489	4496	4502	4509	4516	4523
3.3	4530	4537	4544	4551	4557	4564	4571	4578	4585	4591
3.4	4598	4605	4612	4618	4625	4632	4639	4645	4652	4659
3.5	4665	4672	4679	4685	4692	4698	4705	4712	4718	4725
3.6	4731	4738	4745	4751	4758	4764	4771	4777	4784	4790
3.7	4797	4803	4810	5816	4823	4829	4835	4842	4848	4855
3.8	4861	4867	4874	4880	4887	4893	4899	4906	4912	4918
3.9	4925	4931	4937	4944	4950	4956	4962	4968	4975	4981
4.0	4987	4994	5000	5006	5012	5018	5025	5031	5037	5043
4.1	5049	5055	5062	5068	5074	5080	5086	5092	5098	5104
4.2	5111	5117	5123	5129	5135	5141	5147	5153	5159	5165
4.3	5171	5177	5183	5189	5195	5201	5207	5213	5219	5225
4.4	5231	5237	5243	5249	5255	5260	5266	5272	5278	5284
4.5	5290	5296	5302	5308	5313	5319	5325	5331	5337	5343
4.6	5348	5354	5360	5366	5372	5377	5383	5389	5395	5400
4.7	5406	5412	5418	5423	5429	5435	5441	5446	5452	5458
4.8	5463	5469	5475	5480	5486	5492	5497	5503	5509	5514
4.9	5520	5526	5531	5537	5542	5548	5554	5559	5565	5570
5.0	5576	5582	5587	5593	5598	5604	5609	5615	5620	5626
5.1	5632	5637	5643	5648	5654	5659	5665	5670	5676	5681
5.2	5686	5692	5697	5703	5708	5714	5719	5725	5730	5735
5.3	5741	5746	5752	5757	5763	5768	5773	5779	5784	5789
5.4	5795	5800	5806	5811	5816	5822	5827	5832	5838	5843
5.5	5848	5854	5859	5864	5869	5875	5880	5885	5891	5896

vulcanite ring, which, in turn, is held by a spring-clip attached to the adjusting piece. On opening this spring-clip the ball is released, and falling parallel to the graduated staff is received into a padded box attached to the bed-plate.

It is perhaps needless to say that the exposure is made while the ball is falling, and that the length of the exposure is computed from the scale readings of the beginning and end of the black line, which marks on the negative the path of the reflected image of the sun.

To facilitate the computation of results I have prepared the above table,

which gives the time of falling to the ten-thousandth part of a second for each hundredth of a foot from 1.00 foot to 5.59 feet.

The formula used in computing this table is $t = \sqrt{\frac{d}{g}}$ when t = time; d = distance fallen; and g = 16.083 feet—the gravity constant at our latitude.

The manner of using the table will be made apparent by the following example:

An exposure having been made with a Prosch duplex shutter, the beginning of the black line, marking the course of the sun's image on the negative, was found to be opposite the 4.02 feet staff graduation; and its end opposite the 4.29 feet graduation. Referring to the table it appears that

Time of falling	4.02 feet	= 0.5000 seconds.
" "	4.29 "	= 0.5165 "
Time of exposure		= 0.0165 "

With a well-made shutter the accordance of the results obtained with this apparatus is remarkable. For example, three consecutive tests for fastest speed of a Prosch duplex shutter gave the following values:

First test	0.0164 seconds.
Second test	0.0167 "
Third "	0.0179 "
Mean	0.0170 "

Each test brought into play a different part of the staff graduation.

Table giving the time in ten-thousandths of a second for each hundredth of a foot for a falling body at latitude 42.20.

I shall now give the results obtained for speed of a number of well-known shutters tested with the apparatus just described:

(*To be continued.*)

[*From the Journal of the Franklin Institute.*]

PHOTOGRAPHY IN THE COLORS OF NATURE.

BY F. E. IVES.

[A Lecture delivered before the Franklin Institute.]

(*Continued.*)

On November 23, 1868, Ducos Duhauron, of Paris, applied for a patent* for a process which differed from Collen's only in the manner of carrying out the same idea. Like Collen, he assumed that the spectrum is made up of three primary color rays and mixtures thereof. He said: "My procedure rests on the principle that the simple colors are limited to three—the red, the yellow and the blue—the combination of which in divers proportions produces the infinite variety of shades in nature." Like Collen, he expected to solve the problem by superposing red, yellow and blue prints taken from negatives made by yellow and blue, red and blue, and yellow and red light. But, instead of using plates sensitive to single colors only, he proposed to use plates sensitive to all colors, and to prevent the action of color rays not wanted by filtering them out with color screens placed in front of the photographic objective or sensitive plate; and, instead of superposing two negatives to act as one, from which to make the color prints, he proposed to make two colors (two-thirds of the spectrum rays) act to

* Class xvii, Sec. 3, Serial No. 83,061.

produce each negative, which amounts to the same thing, and would not obviate the defect I have mentioned as resulting from the doubling of intensity on uncolored objects. He proposed to make one negative through an "orange" screen, calculated to absorb the blue light and transmit the red and yellow; one through a "violet" screen, calculated to absorb the yellow light and transmit the blue and red; one through a "green" screen, calculated to absorb the red light and transmit the yellow and blue.

It was no more possible to carry out this idea in Duhauron's way in 1868 than to carry it out in Collen's way in 1865. It is true, Duhauron tried to carry it out, and showed specimens of work, but the red and yellow rays did not act on his sensitive plates,* and he admitted, in a communication to the French Photographic Society,† that "the production of good results will * * * involve the manufacture of compounds which have not yet been created."

Soon after Duhauron showed his first specimens, Charles Cros, of Paris, published another modification of Collen's plan.‡ Like Collen, Cros proposed to make one negative by the action of red light, one by yellow and one by blue—but by exposing the sensitive plates through red, yellow and blue screens instead of employing plates sensitive to single colors only. Instead of superposing each pair of these negatives to make each color print, he proposed to make a green print from the negative made by red light, a violet print from the negative made by yellow light, and an orange print from the negative made by blue light. He also suggested that ordinary positive prints made from these negatives might be illuminated each by the kind of light which it represented, and the three combined by the aid of suitable optical devices so as to form a single picture, showing all the colors. Cros' plan, although it could not succeed, because based upon the same false and misleading theory as that accepted by Collen and Duhauron, nevertheless possessed one important advantage over the preceding methods: it was free from the defect of doubling intensity on those parts of the negatives representing pale or uncolored objects. But this advantage would be lost again in the production of green, violet and orange-colored prints, which will combine to reproduce yellow and blues only with a degree of degradation comparable to that produced by Duhauron's method.

On December 3, 1869, M. Poirée, of Paris, in a communication to the Photographic Society of France,§ expressed doubts concerning the correctness of Duhauron's and Cros' theories, and suggested that better results might be had by making a greater number of negatives—a separate negative for each spectrum region. He said: "The process which seems likely to succeed best is that in which the colors are analyzed by isolating successively each ray, or at least the rays of the same shade. * * * This analysis is difficult to make with colored glasses; it might be done, as by Newton, by monochromatic lighting and successive exposures to simple rays of the same shade. * * * The synthesis is made by means of black positive images and rays of the same nature as those which produced the corresponding negatives. * * * It will then only be necessary to place one above another the colored images so obtained, so as to form one virtually and really. It will be identical with the model, because it will be formed by the same rays, in the same relation of intensity." This plan also could not then be carried out, because no photographic sensitive plates were sufficiently sensitive to yellow, orange and red spectrum rays.

In 1873, Dr. H. W. Vogel discovered that bromide of silver can be made sensitive to the less refrangible spectrum rays by treatment with certain dyes; and the subsequent discovery of other and better color sensitizers supplied the means for carrying out either Collen's or Poirée's idea.

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* Yellow pigments were photographed by the green rays which they reflected.

† *Photo. News*, 1869, p. 319.

‡ Described in *Photographic News*, Oct. 8, 1869, p. 483.

§ *British Journal of Photography*, 1870, p. 26.

Duhauron, one of the first to avail himself of these discoveries, made some practical progress, and, in 1876, abandoned Brewster's color theory and patented a modified process,* based upon the observation that, while there appeared to be *seven* "principal" spectrum colors, three coloring substances would "serve to express them." The coloring substances he named for this purpose are blue, carmine and yellow; and he decided that, in order to make such a process reproduce the colors of nature, the negatives should be made by the action of orange, green and violet spectrum rays, which are complementary to the coloring substances. Some persons have thought that he had the idea of making negatives to represent primary color sensations; but this supposition is negatived, not only by the absence of any declaration to that effect, but also by the fact that orange does not represent a primary color sensation, either in fact or according to any theory recorded in the text-books, and the violet rays are not the ones which most powerfully excite the blue (violet) sensation. The plan was also utterly indefinite as regards the relative effect of intermediate spectrum rays, and Duhauron himself, owing to the fact that he never tried the method upon the spectrum, had no accurate knowledge of its capabilities. In his latest and "perfected" process (1878),† he employed no plate sensitive to either red or orange light; one negative was made chiefly by yellow light, another by green, and the third chiefly by violet and invisible ultra-violet rays.

Albert, of Munich, also took advantage of the discovery of color sensitizers to try to carry out Collen's principle according to Duhauron's original plan. He was the first to make the color prints by the collotype process, which led to the use of the term "chromo-collotype."

In 1879, Cros‡ abandoned the idea that red, yellow and blue are primary spectrum colors, but still held that there are three primary colors and mixtures thereof, and that these primary colors are orange, green and violet. Like Duhauron, he decided to make negatives by light of these colors and prints in blue, red and yellow.

(*To be continued.*)

[*From Journal of the Photographic Society of India.*]

WASHING EIKONOGEN, AND AFTERWARDS PRESERVING IT.

BY PROFESSOR W. K. BURTON, *College of Engineering, Imperial University, Japan.*

WHEN first the improved eikonogen was issued, it was evident, even to those who had found no particular advantage over pyro in the old granular form of the preparation, that the developer had certain decided advantages over all others. There was a desire to use it here [in Japan] as in other parts of the world, and considerable quantities were imported, I myself getting out some ten or twelve pounds of the stuff. I was somewhat disappointed to find that a small percentage of the eikonogen when it arrived was black, instead of being nearly white as it should be; but I was still more disappointed when I found that the remaining stock was rapidly going bad on my hands, till, in about a couple of months, I had no eikonogen that I considered worth using; for I found that the dark substance, formed by oxidation, even if it did not make a solution actually dark enough to stain the plate, acted as a powerful restrainer, so that the developer, made from such darkened solution, was actually less energetic than the ordinary pyro-potash developer.

From hints given in the *British Journal of Photography*, and from a communication by Col. J. Waterhouse to the *Journal of the Photographic Society of India*, it appeared that the stock which I had put away as useless might, after all, supply me with at least a certain quantity of clear solution. I have been trying various methods of washing, and preserving the crystals after washing, and I think that I have

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* British patent, July 22, 1876, No. 2,973.

† "Traité Pratique de Photographie des Couleurs," Paris, 1878, *Photo. News*, 1878, p. 115.

‡ *Bulletin of the French Photographic Society*, 1879, p. 23.

now hit on a modification of methods already suggested that gives results as good as any that need be expected, inasmuch as waste is, I believe, reduced to a minimum, and I get the crystals in a form in which they continue to give off a clear solution of only the faintest green tint till they are finished, however long that may be.

Here is the exact operation: I take a whole bottle of eikonogen, and, putting it into a bowl, wash it repeatedly with very small quantities of quite boiling water, stirring vigorously the time, till the water begins to come off fairly clear. These washings are poured into a second vessel, which is set on one side to cool. In a tropical climate, or indeed in any case when the thermometer is much above the freezing point, it will pay to cool the black washings by placing the vessel either in a refrigerator or in a vessel of iced water.

To return to the washed crystals. These are still darkish, but one or two rapid washings with a cold 1 per cent. solution of sulphite of soda will make them quite clean, or very nearly so, and will dissolve away very little of the unoxidized eikonogen. These washings may be thrown away.

By the time that the first washings have become cold, the dark liquid is poured off. It will be found that there is a plentiful black deposit at the bottom of the vessel. My impression when I first saw this was that the oxidized eikonogen had gone down in a solid form, but I soon found that the substance is entirely unoxidized eikonogen, in very minute crystals, only outwardly discolored by the solution of oxidized eikonogen. One or two rapid washings with the cold 1 per cent. solution of sulphite of soda resulted in a considerable quantity of very clean eikonogen, which was added to the other washed crystals.

The recovery of this very considerable quantity of eikonogen from the black solution depends on the fact that, though eikonogen is very soluble in hot water, in the case of water at only a little above the freezing point it is but very slightly soluble, and is deposited in crystals, from a cooling solution, whereas the black oxidized substance, although not very quickly soluble in cold water, is not thrown down, when once dissolved, unless the solution is very concentrated; indeed, I do not know at what state of concentration it would be thrown down.

Next, as to what to do with the crystals. I have tried the plan suggested by Colonel Waterhouse of pouring alcohol over the washed eikonogen, and I have no doubt that it would work well with absolute alcohol. Indeed, it works at least fairly well with the ordinary commercial alcohol that I buy here for less than half a crown a gallon, which contains from 10 to 15 per cent. of water, if care be taken to wash the crystals two or three times with the alcohol first of all, to dry them of the water. Thus I have now two bottles of eikonogen that I washed, as just described, about a month or so ago. I find that, although the alcohol over the crystals has become a darkish brown, the crystals give a very fairly clear solution.

I think, however, that the following plan leaves so little to be desired that there is no need to seek for a better. The crystals, washed with water and then a weak solution of sulphite of soda as described, are placed in a bottle that will not hold water enough to dissolve them. The bottle is filled up with a 10 or 12 per cent. solution of sulphite of soda, and is shaken till it is considered that the solution is saturated. I find that at a temperature of between 60 and 70 degrees Fahr. eikonogen is not soluble to a greater extent than about 4 per cent.; the solution of sulphite of soda is always kept handy, and after the day's work is over, the bottle, with the eikonogen crystals at the bottom of it, is simply filled up with this solution, so that there is always a saturated, or very nearly saturated, solution of eikonogen, in a 10 or 12 per cent. solution of sulphite of soda in the stock bottle, and this will always be quite clear and almost colorless.

For example, ten days ago I took a quart bottle and washed enough eikonogen to about half fill it, and then filled the bottle to the stopper with a 10 per cent. solution of sulphite of soda. For reasons of economy I had not washed the crystals absolutely

clean, and for that reason the solution was a darkish green at first. It developed well, however, and having replenished the bottle two or three times with the 10 per cent. solution of sulphite of soda, the last trace of the darker product of oxidation is gone, the solution comes off perfectly clear, and will, I feel sure, continue to do so till there is no more eikonogen left; but that will be a long time I fancy, for there is no perceptible diminution in the quantity of the crystals as yet.

I think that the best way in which to preserve eikonogen, if one has the good fortune to get it in good condition, is to cover it immediately with a solution of sulphite of soda, drawing this off to be used for development, and replenishing with fresh sulphite solution. Should the eikonogen have "gone bad" before it is received, it should be washed as I have described, and should then be preserved under a solution of sulphite of soda.

As pointed out by a correspondent in the *British Journal of Photography* some time ago, an excellent ink results as a by-product of this washing of eikonogen! Ink is pretty cheap certainly, but it is a fact that the dark liquid got from the first washing of the eikonogen gives an ink of a very fine color, which seems to flow from a stylographic pen more freely than any other ink that I have tried.

Until quite recently I found a great difficulty in working eikonogen in such a way that I could compensate for over-exposure, unless I mixed up a fresh solution for each plate, and that is a thing that makes eikonogen a very costly developer. It was all right when I knew that plates were not over-exposed, but when, for example, I came home with a dozen or more plates exposed on various out-of-door subjects, and was not at all sure but that some of them had been much over-exposed, I found pyro much more reliable than sulphite. I, however, struck a little time ago on a plan of working that seems to be very satisfactory. I can, I think, best give an idea of it by describing just how I developed a dozen 12 x 10 plates a few days ago, that had been exposed on various subjects.

The following developer was made up:

Saturated solution of eikonogen (with sulphite of soda), 10 ounces.

10 per cent. solution of carbonate of soda (common washing soda), 2 ounces.

Bromide of potassium, 12 grains.

This developer is, for an eikonogen developer, slow on account of the bromide and of the comparatively small quantity of alkali, and it tends to give great density, on account of the fact that it is nearly saturated with eikonogen. Consequently, if a plate has had several times the least exposure that will give a satisfactory negative with an ordinary eikonogen developer, it will still give a vigorous negative under this developer.

In a small measure then there is prepared the following:

Saturated solution of eikonogen, 6 drams.

10 per cent. solution of washing soda, 6 drams.

If the plate appear to have been over-exposed, development is allowed to go on in the bath first described, but if not, the plate is removed from this bath, is held level on the fingers of the left hand, and is flooded with the ounce and a half of developer made up of equal parts of saturated solution of eikonogen and of a 10 per cent. solution of washing soda. This will bring up the detail in a surprising manner. Should it appear that the detail is likely all to be out before the density of the high-lights is sufficient, all that has to be done is to let the plate go back into the dish. In any case, the developer that has been flowed over the plate held in the hand is allowed eventually to drain into the dish, as the quantity of it that I have mentioned seems just about enough to keep the original developer up to the mark for further development.

Should it appear necessary to force development, I have found the following method to work well. The plate is taken from the dish, is held in the hand, and is flowed simply with a 10 per cent. solution of washing soda, which is kept moving

over the surface, as in developing a wet plate. After a quarter of a minute or so, this solution is run to waste, and the plate is returned to the bath for half a minute or so. By repeating this operation several times over, it is, I believe, possible to get out all the detail getable from a plate that has had less exposure than it should have had.

In the case I have referred to, six plates were developed in the same solution; then, as it seemed to get slow in spite of the small addition with each plate, and got rather dark-colored too, a fresh lot of solution was mixed.

[*From the British Journal of Photography.*]

THE NEW BENZOLINE LIME-LIGHT.

BY ALBERT W. SCOTT.

Minor Applications.

The application of benzoline and similar fluids to the enrichment of coal gas, air and oxygen, gives a wide field for experiment, even when confined to lime-light purposes. Benzoline in the warm bath saturator, through which oxygen is passed, is capable of producing a most powerful lime-light without the aid of coal gas or ether; and if used to enrich coal gas, the same saturator trebles or quadruples the lighting powers of the gas—one foot of enriched gas being equal to about four of ordinary coal gas.

If we pass air through the warm saturator, an excellent quality of combustible gas is produced, which burns similarly to coal gas. This enriched air, when applied to the lime-light, gives a very fair light, though, as might be expected, it is inferior to ordinary coal gas. It is possible to get a three hundred candle lime-light in this way; and as enriched air is non-explosive, and quite incapable of producing "pops," it is evident that the most timid or absent-minded operator can employ it without uneasiness. The process is to use two gas bags—one containing oxygen, the other being filled with air from a bellows; the air is passed through the warm saturator, and being thus converted practically into coal gas, is used precisely in the same manner. Dissolving is of course easy, and the light steady, quiet and passably brilliant.

When coal gas can be obtained, it is of course better to fill the gas bag with it instead of air, as it gives a much better light and is just as safe. To give an idea of the capabilities of the different processes, it may be said that with a large-bore nipple, a certain fixed pressure of oxygen, and with the warm bath saturator—

Enriched air gives about	....	300 candles.
Plain coal gas "	....	400 "
Enriched coal gas "	....	520 "
Enriched oxygen "	....	600 "

I do not think that enriched air will be much used, because it requires two bags and gives only three hundred candles light; while enriched oxygen gives six hundred candles or more, and needs but one bag or cylinder. Enriched oxygen under certain conditions will give loud "pops," while enriched air cannot pop. Recently one of my customers, using a warm bath saturator, was arranging the apparatus for a lantern exhibition. Being in a hurry, he forgot to light the night-light, and used the saturator cold; the result, on turning off the gas, was a pop which startled him, though it did no damage. When the audience assembled, he took care to have the saturator warm by using the night-light, and did not have any more cracks.

Several persons have written to me giving particulars of using benzoline in cold ether saturators; their experiences were about the same. They had a fairly good light, with plenty of roaring and hissing at the jet; after a while the light deteriorated, and the winding up was an explosion, if an unstuffed saturator was being used, which did considerable damage; or, if a stuffed vessel was employed, they had a pop, rendered much louder than necessary by having a long pipe between saturator and jet.

Oxygen which has traversed a cold benzoline saturator leaves it in a highly explosive condition; it is exceedingly apt to pop, and is practically unworkable on this account, besides its noisy attributes.

Oxygen which has passed a heated saturator is almost non-explosive; it will not "pass back" even if burnt as coal gas in a blow-through jet with its large hydrogen aperture, and it works silently. If sufficient heat is used, enriched oxygen is as safe as coal gas, and cannot pop. I wish to make it distinctly understood that I consider unstuffed vessels used cold with benzoline as dangerous, because they are liable to explode. The benzoline lime-light is coming fast into use, and an accident now would be disastrous to its reputation. My vessels, being stuffed, cannot under any circumstances burst so long as the wool remains in them. Flame can be passed through, and any number of pops can be produced, if required, by using them cold; but I have never been able to rend asunder stuffed vessels, even when made of tin so thin that it could be easily cut with a pair of scissors.

Unstuffed vessels, if used warm, are even more dangerous, for there is in addition to the chance of bursting the additional fear of sending benzoline steam into the oxygen gas bag.

Heat applied to a vessel containing loose liquid must cause it to boil, the steam must go somewhere, and if the jet taps are turned off, it will go into the gas bag, and if a pop should occur the bag might be exploded.

Heat applied to a stuffed vessel saturated with benzoline does not cause it to boil; there is no steam to go anywhere, and if the jet taps are turned off, not a particle of benzoline will find its way into the gas bag. This is a most important point, for it ensures safety.

By way of a crucial test I have filled a stuffed vessel with inflammable fluid whose boiling point was about 100 degrees Fahr., and, after draining, immersed it in hot water at 150 degrees Fahr., and there was no steam; when a yard of rubber pipe was placed on one nozzle of the vessel and the other nozzle was closed, there was no issuing vapor at the end—certainly not enough to be lit with a match. If a heat of 150 degrees Fahr. is safe, it is clear that 80 or 90 degrees, the temperature used in the air bath, cannot be attended with the slightest risk.

It might be supposed that the pops would burn the wool stuffing. I have hitherto not found any signs of scorching when pulling experimental vessels to pieces; but it is desirable if a pop should occur to turn off the tap of the oxygen gas bag quickly, in order to preserve the wool packing. As a matter of fact, no pop has yet occurred to my knowledge with the warm bath saturator when used hot with light benzoline.

WOOD FIBER IN PAPER.

Recently we gave a description of a ready means of detecting the presence of wood fiber in paper, which is a decidedly deleterious ingredient in any paper required for photographic purposes. We have now to refer to another important point in connection with the same important substance: the size used in giving the paper its stability. Our readers will, perhaps, scarcely need reminding that paper, as first produced, is nothing more than an analogue of "blotting-paper"; it is soft, rotten, and woolly in appearance and touch. To get rid of these defects the blotting-paper is dipped into a solution containing some substance of a glue-like nature, and then hung up to dry. All the rottenness is gone, and according to the quality of the fiber there is produced paper of various quality, which only needs passing through a press to render it fit for use. The chief characteristics of paper as appealing to photographers are governed by the composition of this glue-like substance, this "size"; and so conservative are paper-makers that it is difficult to persuade them to vary their process in the slightest

degree. If a particular paper suits, well and good; if it do not, the inquirer must go elsewhere.

M. W. Herzberg, in the *Moniteur Scientifique*, gives a ready means of distinguishing whether paper is prepared with a resin or animal size. The former, he states, is evenly distributed in the entire mass of a sheet of paper, while animal size forms two layers entirely separated from each other by the body of the paper. Hence, if the paper is well rubbed and bruised, any characters traced upon it (presumably in ink) penetrate through if an animal size has been used, while a resin size is indicated by the writing remaining confined to the particular side it was first put on.

An important part of paper-making is so preparing the pulp as to have it perfectly white; usually this is done by bleaching with chlorine, and then getting rid of the chlorine by means of hyposulphite of soda; and the danger of the presence of any trace of this substance is too well known to need dwelling upon. The best paper is made without any chemical bleaching at all. According to the *Moniteur*, as above, two English manufacturers are using electricity in the bleaching of the pulp, rendering it perfectly white without injury to its strength. The process depends on the use of a solution of magnesium chloride which is decomposed by the action of a powerful current into chlorine and oxygen on the one hand, and into magnesium and hydrogen on the other.—*Brit. Jour. Photog.*

OBITUARY.

PROFESSOR H. D. GARRISON.

On Monday, February 23d, there passed away one of the most earnest workers in photography in the city of Chicago, Professor H. D. Garrison, a well-known member of the Photographic Society of that city, and a contributor to the best photographic literature of the day. His death was caused by cerebral apoplexy. He was an active worker in the medical and pharmacy schools of Chicago, and leaves behind him many admiring friends in the ranks of these professions throughout the country. We glean the following account of his life from Chicago journals:

Professor Garrison was born in Dearborn County, Indiana, October 5, 1834, and completed his studies in a Cincinnati medical college. During the rebellion he served as First Assistant Surgeon in the Fourth Indiana Volunteers, then attached to the Seventy-seventh Regiment. After Lee's surrender he went to Cincinnati and practiced medicine for a while. Then he came to Chicago. He was not satisfied until he had started the Bennett Medical College. For years he filled the chair of professor of chemistry. Prior to this, however, he had established the drug firm of Garrison & Clark, which for years flourished at 511 State street. In 1878 he resigned his chair in the Bennett Medical College, and started on a year's lecturing tour in the Old World. In London he delivered a series of brilliant lectures on evolution and chemistry. He was a widower then, having a few months before buried his second wife. It was in London that he met and won Miss Marie Harold, who survives him. He had started out on a professional trip, but it ended in a honeymoon. After several months spent in Egypt, the Holy Land and Rome, Professor Garrison and his bride returned to Chicago. In the latter part of 1879 he accepted the chair of chemistry in the College of Pharmacy, at 465 State street, and later was created a dean of the college. This position he held until November of last year, when he resigned and entered the lecture field. His season had advanced only two weeks when

he was stricken down by the illness which resulted in his death. For two months he had been confined to his room.

Shortly after his return from Europe Professor Garrison organized the Evolution Club, and has been its foremost advocate and supporter. He was a member in high standing of the American Association for the Advancement of Science, and had contributed much to the scientific literature of the day. He was a member of Grant Post, Grand Army of the Republic, of the Sunset Club, the Lantern Slide Club, the Camera Club and other organizations. He was a devoted lover of his science, and had often expressed the wish that his body, after death, be turned over to some medical college for scientific purposes. His widow did not agree to this plan, but she consented to an autopsy, which was held under the direction of Dr. Edwin F. Rush, who was assisted by Drs. W. K. Harrison, H. E. Hildebrand and E. Reading. The brain was found to be abnormally large, weighing sixty ounces. Humboldt's brain weighed just four ounces more. Prof. Garrison leaves a wife and three grown-up children.

OUR ILLUSTRATION.

The Rocky Mountains are, perhaps, the most world-wide range of highlands known on the American continent. The region around them is of the wildest character, and full of the memories of the struggles of pioneers for supremacy over Indians and natural obstructions in the occupation of the Great West. Some time ago we were fortunate enough to obtain a number of handsome negatives made by Mr. W. E. Hook, of Manitou Springs, Colorado, showing scenes in the region of Pike's Peak, in the Rocky Mountains. One of these views forms the illustration for this issue of the Bulletin. They have an additional interest from the fact that they were made on Anthony's climax negative films, whose small weight and slight bulk made it very much easier for Mr. Hook to obtain these views than was formerly the case. All the negatives give the same good prints, and the beauty of the work speaks for itself.

THE APPLICATIONS OF THE CARBON PROCESS.—A CORRECTION.

Errata. Page 112, line 23, read *chromic* instead of chloric acid. Page 13, line 2, read 15 or 18 *decimeters* instead of centimeters. P. C. D.

HOTEL RATES TO PHOTOGRAPHERS ATTENDING THE CONVENTION AT BUFFALO.

Iroquois Hotel	can	take	150;	per	day,	$3.00	and	upward.
Hotel Broezel	"	"	200;	"	"	2.50	"	"
The Genesee	"	"	165;	"	"	3.00	"	"
The Tifft	"	"	400;	"	"	2.00	"	"
"	"	Two in a bed;		"	"	1.50	"	"

The Iroquois will be headquarters.

S. L. Stein,
G. M. Carlisle,
Committee on Hotels.

ANTHONY'S
Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.

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EVERY ISSUE ILLUSTRATED.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held on Wednesday evening, February 11th, the *President*, Mr. J. G. BULLOCK, in the chair.

The Board of Directors reported the election of the following active members: Charles Howell Miller, Robert M. Elliott and Nathaniel Howland Brown. They also reported the presentation to the society, by the publishers, of a bound volume of Anthony's Photographic BULLETIN for 1890.

Dr. Charles L. Mitchell read a paper on "Intensification," of which he subsequently gave a practical demonstration. (See page 136.)

An exceptionally fine collection of lantern slides, illustrative of Japanese life and customs, and loaned by Dr. E. H. Williams, were shown. The slides were colored by Japanese artists, and their exhibition was rendered doubly interesting by the presence, as invited guests, of four Japanese gentlemen, Messrs. Tsuda, Terashima, Tsuji and Suzuki, who gave a quaint and often witty explanation of the views on the screen. At the conclusion a vote of thanks to the Japanese visitors was proposed by Dr. Mitchell, and carried unanimously.

Mr. Carbutt presented for examination some positive prints on thin sheets of celluloid, to which he had given the name of "Cellugraphs." The prints were made by an exposure in diffused daylight of one to one-and-a-half seconds. It was recommended to tone them in the following bath: 16 ounces of water, 3 grains chloride of gold.

Mr. Bell exhibited a few pictures on the same material as that shown by Mr. Carbutt. His first trial had failed from his own lack of knowledge how to develop them. By weakening the developer down very much and timing fully, the operator could have the development under perfect control—could stop anywhere, and could use quite a quantity of light in developing. He had not tried them by gaslight; they were all exposed by daylight.

Mr. Bell showed a negative made on a Cramer 50 plate, with very brief exposure. It was about twice as dense as should be, but was shown to illustrate the value of a developing formula which he had devised. By weakening the developer a negative of proper density could readily be obtained, and the difficulty sometimes experienced in getting full density with very rapid plates was entirely overcome. His formula had been published in Wilson's *Photographic Magazine*, January 3, 1891, and was as follows:

HYDROQUINONE AND EIKONOGEN DEVELOPER.

No. I.

Ice or distilled water (hot), 32 ounces.
Sulphite of soda.......... 2 "

Dissolve, and make acid by sulphuric acid, then add:

Hydroquinone......... 160 grains.
Eikonogen (yellow-white crystals)............. 160 "

No. II.

Water................. 32 ounces.
Carbonate of potassium.. 4 "
Sulphite of soda .... 1 ounce.
Bromide of potassium.... 64 grains.

For use, take equal parts of Nos. 1 and 2; develop until image is seen on the glass side of the negative. Use developer over and over, refreshing with new as needed. The developer keeps well as a mixture of Nos. 1 and 2, but it is preferable to keep it in two solutions, as it allows more liberty at the time of developing by using more of the one or the other, as may be necessary. It does not stain the hands, gives excellent density, and

works quickly at a temperature of 60 or 70 degrees. At low temperatures its action is very slow. Color of negative black, with a gray tint; printing quality very fine, especially after fixing in the following bath, which need not be acid, as in the case of pyro fixing bath, and therefore no free sulphur to trouble:

Water	32 ounces.
Hyposulphite of soda....	1 pound.
Sulphite of soda........	2 ounces.

This fixing bath has kept for three months in use, fresh solution, as above, being added.

Mr. Carbutt thought that the method of instruction defined by Mr. Bell—viz., development until the image is seen on the back of the glass—was an erroneous one. If adopted by beginners or others developing their own negatives, they would get just such an over-dense result as shown by Mr. Bell. Density should be determined by examining by transmitted light, not by depending on what is shown on the back of the plate. All plates will not bear development so far; they would get very hard.

Mr. Bell asked how many members present were able to tell the density by looking through the plate before fixing.

Several members signified their ability to do so. Mr. Bell said he couldn't do it, and he was an old-timer. He could not tell by looking through the film, and if he held it close to the red light he was unable to determine it. Perhaps his eyesight was not as good as others; but that was his mode of teaching, and he had taught people who had been successful to determine the development by the image on the back of the plate.

Referring to the plate exhibited, Mr. Bell said that the Cramer 50 is one of the hardest plates to handle in the market. If he should take a Carbutt B and treat it as he had done the Cramer 50, it would be "cast iron," unless he had increased the time of exposure five times. He was quite sure that his mode of instruction to see the image on the back, and not through it, would give the better negatives.

Dr. Mitchell believed that the best results were obtained by a combination of both, that is, looking at the back and at the face of the negative. The action of the developer on the silver in the plate is gradual, penetrating from the exterior all the way through to the back. Now if, when we develop a plate, the image comes up bright and clear, keeps on clearing, and then commences to fade away and darken out, and we look at the back of the plate and notice that it is perfectly white, we can reasonably suppose that the density of that plate is more apparent than real, from the fact that we are not only looking through a deposit of silver, but also a certain amount of unacted-upon silver, and we have to allow for that in making a calculation of density. On the other hand, a thin plate may be developed until the back is nearly as black as the front, and yet have no density; so that the proper method to pursue, he thought, would be a combination of the two: looking through and looking at the back of the plate; at the same time bearing in mind the quality of the plate, *i. e.*, whether a slow or a fast plate. A slow plate has always more density than a fast one.

Mr. Bell stated that he had no trouble with any plate he had taken hold of; in fact, he could hardly find a bad plate in the market. He had found a few with drying marks on, but he had been fortunate enough not to have run across a batch of foggy plates.

Of course, if going on a journey, he would take precautions and test his plates thoroughly beforehand.

Mr. Cheyney, referring to Mr. Bell's remarks, said that in all his experience in using fast plates he spoiled them if he carried on the development until he could see the image on the back. It could not be carried out until the image was visible on the back without being all fogged up. On the other hand, for a transparency plate, in ninety-nine cases out of a hundred, it would be just right, given the right amount of exposure.

Mr. Bell was quite sure that most of the members lost their plates by under-development, giving only surface development. If they did as he had just told them, they would have no need to resort to any strengthening to build up the negative afterwards.

Mr. Pitman declared in favor of development first in eikonogen and afterwards in hydroquinone. There would then be no trouble in getting any density desired.

Mr. Carbutt said that when in Liverpool he saw some very fine negatives, made by an amateur, which were developed in this way.

Mr. Pitman said that a good many developed in a mixture of the two. He, however, recommended getting all the detail desired with the eikonogen, and then, in the hydroquinone obtaining the required density.

Mr. Earle here brought to the notice of the members a method of printing on porcelain and burning it so that it could not be touched, even by a sharp knife. He had scratched the surface without defacing the picture at all, showing how hard the firing

had been done. The process he was unable to describe fully, as the inventor would not explain it entirely; but the secret seemed to be in the amount of heat necessary. The firing is done by the inventor himself. It is a German process, and the inventor says that in Germany many of the tombstones have on them the pictures of the deceased friends below, with the dates as well.

In reply to a question from the Chairman, Mr. Earle said that it was not necessary to send to Germany to have the work done; it could be done in Philadelphia. Coloring could also be introduced, requiring a double firing in that event.

The Secretary showed a sample of "Dr. Andresen's Eikonogen Cartridges." They provided a portable form of eikonogen developer for use in traveling or when such form might be desirable. For use they were simply broken and the contents dissolved in a proper quantity of water.

The Chairman called the attention of the members to the fact noted in the medical journals, that uranium salts were of an extremely poisonous character. Heretofore it had not been known how poisonous they were, and it would be well to bear this in mind in using them.

Mr. Stirling—I would like to ask a question of the society. I have here a Darlot lens, made specially for lantern projection, which has some peculiar features. It has a 10-inch focus. The ordinary lenses which are furnished for the same work are the Darlot 4 x 4 lenses, which are probably, I was going to say, twice the diameter.

The question I want to ask is, Whether this lens ought not to transmit as much light as the larger lenses? If it does not, what proportion of the light does it cut off? Theoretically the objective is placed in the focus of the condenser. To be perfect that ought to be a point—the point of a cone. Now, why a lens of that diameter should not transmit the whole of the light is an interesting question.

In the present number of the *British Journal* the editor, under the head of "Lanterniana," takes up that point, and says that the answer can be both Yes and No; that if the radiant is, as it ought to be, in theory an absolute point, if the condensers transmit the rays as they ought—*i. e.*, converge them to a point—then a lens of small diameter should transmit as much light as the larger one, the additional glass and brass work being so much waste and expense. In the matter of expense I would say that a 4 x 4 Darlot lens is worth $32 or $34. I do not know what this may be worth, but it cost less than a third of that figure.

The editor of the *British Journal* goes on to say that practically the radiant is not a point; it sometimes spreads until it is perhaps three-quarters of an inch in diameter. The slide also tends to diverge the rays, so that instead of being a cone at the focus of the condenser, there is a bundle of rays of varying thickness, dependent upon the degree to which the condenser and the slide destroy the perfect convergence of the rays; so that under certain circumstances this lens will transmit as much light as the other, but the chances are that the convergence won't be perfect, and therefore the larger lens is better.

A writer in a book just published on "Optical Projection," says that opticians have gone to the extreme in either direction. For long-focus work they have provided lenses of three and four-inch diameters. He says it is utter waste of material. In some foreign lanterns the low-power objectives are made with the rear combination larger, because the lens being brought closer to the condenser, the angle is a greater one, and there is more danger of rays being cut off there than with a longer focus lens where the angle is a narrow one.

I would like to ask whether any of the members have thought about this, and whether any light can be given on that point?

Mr. Cheyney—Some years ago Mr. D. S. Holman, then Actuary of the Franklin Institute, found that in order to get the best illumination for the lantern microscope, and also for the table microscope, the angle made by the rays from the condenser should coincide with the angle with which the objective should receive them, in order that the rays should not be refracted any more than possible; or, in other words, there should be a certain relation between the focus of the condenser and that of the objective, and that wherever this relation was changed it was done at the expense of light.

Adjourned. Robert S. Redfield,
Secretary.

THE AGASSIZ ASSOCIATION, MANHATTAN CHAPTER, NEW YORK B.

Working quietly, and almost unknown in the busy scientific world, the photographic section of the Agassiz Association is adding its quota to the progress of photography. The

association itself is a scientific body, the photographic section numbering about forty, but with only some ten really active members. Meetings are held monthly at the residences of different members, and are characterized by steady social discussion and mutual improvement. The work of the members has culminated in an exhibition of prints, negatives and lantern slides which would do credit to our more powerful and influential organizations. The exhibition was held at 139 West 40th street, the residence of Mr. E. Miller, the enthusiastic Secretary of the section, being open for three days, March 4th to 6th. Diplomas were awarded for special excellence, H. T. Rowley receiving one for the best all-round exhibit and the second award for landscapes; F. Albers, for portraits; H. Bucher, the first award for landscapes; and W. T. Demarest, the award for the best group.

Looking at the exhibit as a whole, the committee must be specially praised for the excellent arrangement of the prints. These were sent in unframed and were mounted on screens, being bordered by their laths. A glance around showed the exhibit to be decidedly amateur. Here and there was a bit of particular excellence, but there was a great deal that told tales of over-exposure, under-development, under-printing and, particularly with the aristotypes, sad over-toning. The platinotypes were, however, very good, and the quantity on exhibit showed that the members had made this beautiful process a special study.

The prize portrait picture, "Sorting Cigars in the Attic," by F. Albers, was a delightful study of an old man working in a dimly lighted room. Indeed, for a single lens, it was remarkably good. The prize landscape picture, "College Point Suburbs," by H. Bucher, Jr., together with some six similar pictures, were excellent. Some flash-light studies, "A Fair Maid of Switzerland," by the same gentleman, must have run the prize portrait picture very close. Number 72, "English Tourists Ascending Monte Rosa," was very poor, but its author was redeemed by his other pictures, "Swiss Chalet" and "Berne, from Nydeckbridge."

Mr. E. Miller had a large exhibit on aristo, platinum, bromide and other papers, but showed up best in his platinum prints. Four of these, views in Central Park, "Entrance to the Cave," a capital picture, a girl in white, artistically arranged to set off the gloomy interior, "At the Lake," "In the West Park" and "The Pool," were remarkably excellent, showing most artistic feeling and excellent treatment of the platinum process. A little group, "Carpenters," by this gentleman was also much admired—three little tots playing in the doorway of a workshop. Mr. Miller was also particularly successful with the ferroprussiate process, one in particular, "Bit of Ramble, Central Park," attracting much attention.

W. T. Demarest had quite a large number of prints, but particularly excelled in the platinum process. His "Study in Posing," taken with a single lens, received the prize for groups; but a picture, "Halma," a flash-light, showing four ladies deeply interested in the well-known game, seemed to be more representative of Mr. Demarest's capabilities. "Mother's Old Home," a very pretty picture of a house half-hidden by foliage, was spoilt by having the corners trimmed off.

C. Putnam's exhibit, on albumen paper, was very creditable, but more attention should be paid to the development of snap-shot negatives. Several of his marine pictures were very good, but there was a considerable flatness about the majority of his exhibit.

Taking the exhibit in its entirety, too much praise cannot be given to all concerned in its production. Some three hundred pictures were on exhibition, and while it must be acknowledged that there were many hung which were very mediocre, the majority were of a quality to convince one and all that the Agassiz Association is doing really good work, and working for the love of photography. This exhibition, the first held by the section, will not be the last, and will serve to spur on the members to renewed and more strenuous efforts, and will, we doubt not, add very considerably to the membership roll.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

The large attendance at the meetings of this section testifies to their popularity. The management always provide a good fund of excellent material and most cordially welcome any new comer. The regular monthly meeting was held on Tuesday, March 3d, President Henry I. Newton occupying the chair.

The Secretary announced the receipt of various photographic publications, and of an invitation to a photographic conference to be held in London, from the 6th to the 8th of April. At the next meeting, on April 7th, there will be an exhibition of lantern slides made some twenty to twenty-five years ago. Along with these, several more modern slides will be shown.

Mr. Newton said it gave him great pleasure to introduce Dr. J. W. Bartlett.

Dr. Bartlett, by the aid of the lantern, carried his audience from the docks on West street to the *Majestic*, giving us several bits aboard ship, to Queenstown. Seated on a

jaunting-car we availed ourselves of our short stay here, and caught several views of the harbor and neighboring islands. Arriving at Liverpool, after a peep at the docks we were carried to London, and shown the sights. St. Paul's, Westminster Abbey, the Tower, St. Mary's, Buckingham Palace, Trafalgar Square and other historic places being visited, a short trip was made to Windsor, and pretty views of the castle laid before us.

On from London, through Paris, we were taken to Brussels, the Hotel de Ville with its tower, 370 feet high, standing out sharp and clear. Through Cologne, with a passing look at the cathedral, on to the famous watering place, Wiesbaden. Along the Rhine we stood entranced before the fine old ruined castles. Through Berlin, with its imperial residences, to Dresden, the capital of Saxony. Here we paraded in the great square, visited the cathedral, built 1737, and wandered through the busy market. Thence to Vienna and terminated our journey in Venice. Here we floated along the Grand Canal, admired the Bridge of Sighs, crossed the Rialto, fed the pigeons and marveled at the Campanile Tower, built 900. A most enjoyable evening was spent, Dr. Bartlett giving a terse description of each slide, which yet conveyed a large fund of information.

A hearty vote of thanks was accorded Dr. Bartlett at the close of his remarks.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—W. B. A. writes: By this post, I send you a few photos to show you how the albumen paper works in my hands. This state of blisters has been going on now for over twelve months. They commence to blister in the hypo. In every batch I have them more or less. I have read and tried remedy after remedy, but still they come. Can you give me any idea of how I can get rid of them?

A.—If you were to tell us how you work we could help you better. Try a salt bath to put the prints in before you put them into the hypo. If the water is of a sparkling character that you use, we would advise you to boil some, and after cooling it use the cold boiled water to make the hypo bath. Also be careful that the hypo bath is not too cold, that is, not more than five degrees colder than the room you are working in.

Q.—H. S. writes: Please be kind enough to send the formula for the developer for the old daguerreotype process.

A.—There was no special formula used; the development was made by holding the exposed plate over a bath giving off the vapors of mercury.

Q.—E. J. C. writes: I have been trying a recipe by William Bell for making dry plates, but did not make it work very well. I don't think he gives all the particulars, so a person that is not pretty well acquainted with the business could succeed. It is in Vol. 21, page 186. Now will you send me a reliable receipt with all the particulars for making emulsion for portraiture?

A.—We cannot give any more information than is to be found in the article to which you refer. But you will find all details about dry-plate making in the book called "Modern Dry-plates," written by Dr. Eder, and published by the proprietors of the BULLETIN.

Q.—W. W. T. sends us a rather flat portrait of a young girl, which he desires us to criticise, stating at the same time that he is a beginner, makes his own gold chloride, silvers his own paper, and is very glad to learn.

A.—The first fault that we have to find with his portrait is, it is very much over-exposed. A great improvement would also result if the light on the figure was greatly toned down by the use of screens. The posing is good and very life-like.

Q.—C. F. writes: Would you kindly inform a reader of your paper through the columns of "What Our Friends Would Like to Know," if iodide of potassium has the same effect as iodide of silver in iodizing a silver bath for wet plates, and how much is necessary to iodize a bath 2 pounds large, and 40 grains to the ounce strong.

A.—Add 8 or 10 grains of iodide to the 2 pounds of bath. You will know when you have enough by some of the iodide of silver remaining undissolved. The object of the iodide is to saturate the bath with silver iodide. This treatment has the same effect as adding iodide of silver to the bath.

Q.—D. H. H. writes: If a solution of any of the alkalies used in developers be made with pure soft water, and kept in stock solution in a corked bottle part full of solution, and part air over the solution in the bottle, will the solution be good for developers as long as the solution remains clear as when made, or does any unseen decomposition occur that will impair the solution for use in developers? In your answer please include sulphite of soda solution when made by itself, without any of the alkalies used in compounding developer combined with it.

A.—Solutions kept in partly filled bottles, but where the bottles are tightly stoppered, will deteriorate but slightly unless the stopper is removed often. Sulphites follow the same rule as other oxidizable substances.

Q.—T. L. B. writes: Will you let me know through the BULLETIN where I can obtain a plainer description for making collotypes than that by Mr. Warnerke, given in the BULLETIN for February 14th? Also tell me if aristo prints are permanent if worked as directed.

A.—We have not seen any more detailed directions than those given in the article referred to. We expect more details soon, and then they will appear in this journal. Aristo prints are considered more permanent than silver prints, but they are of such recent introduction that time has not had a chance to show what it can do.

Q.—R. E. H. writes: Will you be kind enough to inform me in your next BULLETIN what might be the cause of the white spots you will see on the samples I herewith enclose? When the prints were mounted no trace of spots was perceptible. The next morning, when ready for burnishing, some faint spots were discovered, and since they have increased. Other prints of the same batch, same silver bath, paper, gold, etc., do not show a trace of spots.

A.—The trouble is either in the mounts or in the paste used to mount the prints. To us it looks very much like dust from sulphite of soda or hypo in the paste. Keep the paste well covered at all times, as in sweeping a room the dust from the floor may easily settle on the upper layers of paste.

Views Caught with the Drop Shutter.

SWEET, WALLACH & COMPANY, of Chicago, have just issued a new photographic journal, called *Photographic Review*, which contains selected articles and a list of the apparatus and materials that they supply. It is well presented, and is a modest beginning for what may be a bright light in photographic literature.

THE Genie Camera Company, of Camden, N. J., filed articles of incorporation on March 7th. The object of the company is to manufacture cameras and photographic supplies. The stock is $200,000, and the amount paid in is $5,000. W. L. Brown, H. H. Brown, Morris Earle and John Carbutt are the incorporators.

THE case of Davis against Foster was decided by Judge Leake, of the chancery court, to-day in favor of the plaintiff. It is a novel one, and one that has never been before the courts in Virginia. A short statement of the facts is as follows: Davis, the photographer on Broad street, some time ago sold to a florist a lot of refused negatives, which he wanted to use to cover his hot-house. Foster bought some four hundred of the negatives from the florist, and from these printed photographs and exposed them as specimens in his gallery on Ninth street. Davis obtained an injunction to prevent Foster from so using the negatives, and the court perpetuated the injunction. —*Petersburg, Va., Paper.*

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Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. MARCH 28, 1891. No. 6.

PHOTOGRAPHY IN NATURAL COLORS.

On the 2d of February Professor G. Lippmann sent a communication to the Paris Academy of Sciences, which has led to a great deal of talk in the newspapers upon the subject of "Photography in Natural Colors." As is usual in such cases, the results are not by any means what the average reader would be likely to expect after seeing the reports as printed in the daily papers. The enthusiastic correspondent of the London *Daily News* describes the colors obtained "as vivid as any objects in nature." On the other hand, M. Leon Vidal, of *Le Moniteur de la Photographie*, in Paris, says: "We only saw them rendered very imperfectly, and certainly we should never have suspected, if we had not been told of it, that it was a reproduction of the solar spectrum with the colors."

Nevertheless, M. Lippmann has certainly opened a new field in the development of photography in colors. The theory upon which he has worked is what is called "interference" in optics, and is due to the minute light waves following one another in such a manner that they produce alternate impressions of light and shade in extremely thin films of sensitive photographic material.

To make the matter a little more intelligible, let us recall the fact that science has proved that light is due to vibrations of a medium called ether (for want of a better name), which is thrown into waves that follow one another so rapidly that it takes 36,900 of them to cover 1 inch of length and produce red light, while 64,631 of them to the inch produce violet light. The size of the waves therefore determines the color of the light, the short ones producing the sensation of violet, and the long ones red, on the retina of the human eye. Therefore if some means could be devised by which light could be forced to make vibrations corresponding to the various colors of the spectrum, we should be able to reproduce these colors at will. This is the problem that M. Lippmann set himself to solve. His method is quite simple, and the following extract from *Nature* explains the conditions necessary to success:

"The conditions said to be essential to photography in colors by M. Lippmann's method are: (1) a sensitive film showing no grain; (2) a reflecting

surface at the back of this film. Albumen, collodion and gelatine films sensitized with iodide or bromide of silver, and devoid of grain when microscopically examined, have been employed. Films so prepared have been placed in a hollow dark slide containing mercury. The mercury thus forms a reflecting layer in contact with the sensitive film. The exposure, development and fixing of the film are done in the ordinary manner; but when the operations are completed, the colors of the spectrum become visible. The theory of the experiment is very simple. The incident light interferes with the light reflected by the mercury ; consequently, a series of fringes is formed in the sensitive film, and silver is deposited at places of maximum luminosity of these fringes. The thickness of the film is divided according to the deposits of silver into laminæ whose thicknesses are equal to the interval separating two maxima of light in the fringes —that is, half the wave-length of the incident light. These laminæ of metallic silver, formed at regular distances from the surface of the film, give rise to the colors seen when the plate is developed and dried. Evidence of this is found in the fact that the proofs obtained are positive when viewed by reflected, and negative when viewed by transmitted, light—that is, each color is represented by its complementary color."

In addition to the above M. Leon Vidal states that M. Lippmann uses a film of silver iodide in albumen, placed film-side to the mercury bath, thus making it necessary to photograph through the film itself.

From these statements it would appear that the action of the light is to make a number of thin layers of silver in the body of the sensitive photographic material. The number of these layers will determine the color of the light reflected from the film. For example, if the film has a number of layers that are close together, short light waves only can vibrate between them. If, on the other hand, these layers are farther apart, long waves can vibrate between them. The shorter the waves the nearer the light will be to the blue end of the spectrum, while the long waves will give light toward the red end, according to their length. If the light waves do not coincide with the layers of the silver, darkness will result. These phenomena are often seen in thin films of oil on water, and also in the soap bubble. They are also an explanation of the so-called photographs in colors of the time of the daguerreotype, those of Becquerel for instance. For each color, therefore, it is necessary that the film shall have a definite number of layers of silver to allow light waves of that particular number of vibrations to oscillate between them. The production of films or layers of silver of the desired character has been accomplished by M. Lippmann in his experiments mentioned above. He makes the light form the layers in the film of albumen and silver iodide coated on a glass plate, which is backed against a bright surface of metallic mercury. By this method of procedure the light that first enters the film is reflected back from the surface of the mercury, and in its return to the surface of the film it meets light waves that have entered the film after it. The two sets of waves have the same rate of vibration when they enter the film, but those that reach the mercury surface first are retarded by the reflection to which they have to submit, so that they are half a wave-length behind those that are entering the film. As a consequence of this change of step (so to speak) the first set of waves interfere with the second set, and some of them are extinguished, producing in this manner alternate layers of light and shadow in the film, and the light layers in turn act on the silver iodide, producing corre-

sponding layers of metallic silver. The layers of shadow will of course have no action on the silver iodide.

The reasoning of M. Lippmann has been so well thought out that he has been a le to make a picture in colors of a colored glass window by making the light from an electric light pass through it and then fall on his albumen and silver iodide film on the surface of bright metallic mercury.

Such in a condensed form is the state of this question of photography in colors at the present time. The results obtained appear to be about the same as those of Becquerel when he used the old daguerreotype plate. But the theory of Professor Lippmann may help to some more work on the problem; and if this yields practical results his communication to the Paris Academy will mark an epoch in the annals of photography.

EDITORIAL NOTES.

An important and interesting application of photography was demonstrated before the Academy of Sciences in St. Paul a short time since, when a large number of slides of astronomical subjects were shown and an application of the science as relating to astronomy made, great stress being laid upon the fact that it entirely does away with the personal equation in drawings and computations and shows on record much more than can be seen by the naked eye. Daily photographs of the sun, which have been made since 1857, show conclusively that the sun turns a complete revolution once in eleven years.

Photography is fast coming to be an important factor in surveying, too, often aiding in locating lines of railway and saving much capital in the making of preliminary surveys, which have heretofore been run at great cost, the results often proving of no value after they were obtained—except to show that the projected line was impracticable. By combining the two sciences, however, a very little topography and the same amount of photography, combined, serves the same purpose at greatly reduced cost.

The principal reason that the *Connecticut Guardsman* is making such a decided hit in its photographic department is, we doubt not, because it is in the hands of such an able and enthusiastic amateur as has charge of that branch of the paper; every one knows that few excel in these qualities Mr. C. R. Pancoast, of the Waterbury Camera Club, who so ably edits the photographic columns of the *Guardsman*.

We would tender our thanks for the kind invitation extended by the Stevens Photographic Society, to attend their Third Annual Lantern Slide Exhibition in the early part of this month, and express regrets at our inability to be present.

We are in receipt, from Mr. E. F. Wilder, of Boston, who has contributed an interesting article to the "International Annual," of a set of portraits made in an ordinarily lighted room by the aid of a portable screen, which he describes, and which, for home portraiture, are finely lighted and modeled. The subjects are difficult ones to handle, but are remarkably well treated.

The final passage of the International Copyright law is a matter which we

believe every fair-minded producer in the country should congratulate himself upon, as by its enactment the artist, photographic or otherwise, who possesses the ability to produce a thing which is desired by the public, will find himself in a position to realize from its sale, and will not be at the mercy of those who have found it easier to appropriate the results of the hard worker's energy than to produce for themselves. It should be borne in mind, however, that the proper manner in which to obtain this protection, is to copyright such productions, and that the false insertion of the copyright legend is punishable by a heavy fine.

It will doubtless be of interest to know that the fourth of the joint exhibitions by the Boston Camera Club, the Photographic Society of Philadelphia and the Society of Amateur Photographers of New York, will take place in the Fifth Avenue Art Galleries from May 25th to June 6th, and will probably be one of the most exhaustive collections yet assembled. Medals to the number of twenty-five will be awarded in different classes, and much is promised to interest photographic workers. The judges selected are Messrs. Thomas Moran, Will H. Low and Edward Bierstadt, which is a guarantee of fair and able awards. Full particulars may be obtained from Mr. F. C. Beach, at the rooms of the Society, 113 West 38th street.

We would acknowledge with thanks, tickets to the Lantern Slide Exhibition recently given by Central Y. M. C. A. Camera Section in Association Hall, Brooklyn. The subject of the evening, "A Visit to Sleepy Hollow," is one to which the camera may do ample justice.

We are reminded by Mr. J. G. Cassebaum that putty, applied to the surface of highly polished silver, glassware, etc., is an excellent medium for reducing the high gloss and making them susceptible of being photographed without reflections.

The Society of Amateur Photographers has just received through the Department of State, at Washington, the bronze medal awarded it at the Paris Exposition in 1889.

It is a matter of current rumor that a new photographic society for New York is not an unlikely event, and in this case it will probably be made up largely of reporters and down-town men, who use the science in their business, and who desire facilities in the neighborhood of Newspaper Row for their work; we hope and expect soon to know that the project is an accomplished fact.

A new camera club has been formed in Tarrytown: President, Thomas H. Smith; Secretary and Treasurer, F. B. Morse.

The Brooklyn Society of Amateurs gave a very pleasant and enjoyable lantern slide exhibition on the 28th ult., made up of views taken by four members of the club during a two weeks' cruise in Narragansett Bay.

In cases where it is desired to copy pictures having a highly glazed surface, the best method of procedure is to place the picture at the apex of a large cone of white cardboard, four feet long or thereabouts, and the camera at the base,

the reflections are thus entirely cut off; and for copying an old oil painting no better way exists than to first clean thoroughly with a soft, damp rag, then oil it evenly with poppy oil or linseed oil, using a soft sponge and very little oil. Avoid reflections in copying and expose through a yellow screen, using orthochromatic plates and giving about eight times as long an exposure as without the screen. Eikonogen is said to be the best developing agent for this class of work. We are indebted to Mr. Edward Bierstadt for the above suggestions in regard to oil paintings.

The New York Camera Club feel justly proud in having at last succeeded in producing an arrangement for making lantern slides by incandescent light. They use a square funnel or box painted white, and in which are forty 16-candle-power lights. The light reflected in this way is said to be even and satisfactory in all ways, and far superior to any results obtained heretofore. The exhibition of photographs just closed has been of great interest, twenty-seven members having been represented.

The second annual exhibition of photographic work done by the Hartford, Conn., High School Camera Club took place early this month, and made a most satisfactory showing for the club, the improvement over that of last year being very noticeable.

The Newark Camera Club gave an exhibition of slides from San Francisco and Buffalo last week, several of the former being from Professor S. W. Burnham, of Lick Observatory, and all of which were of a high order of merit.

The annual election of the Adrian Camera Club for 1891 resulted in the following list of officers: President, F. B. Stebbins; Vice-President, W. T. Barnum; Secretary, E. J. Stebbins; Treasurer, Walter Graves.

An excellent lantern exhibition was enjoyed by members and friends of the Cincinnati Camera Club a short time since, in which a number of members were represented, including several ladies, whose work stood very high and gave their brother members a hard task to compete for equality. The club numbers now one hundred and fifty members.

The recent exhibition of photographs by the Hartford (Conn.) Camera Club was most enjoyable. It contained a large number of views by Mr. H. P. Robinson, of England, a reproduction of three of whose studies, appears as an illustration to the Bulletin this issue. Mr. C. R. Pancoast, of Waterbury, was also represented by a large collection of beautiful views.

One rather singular feature of the notoriety recently achieved from the experiments toward photographing in colors, is the fact that sitters are now beginning to ask "to be taken" in the natural colors, and are often quite loath to believe that science has not yet arrived at that point—"they have seen it in the papers, and it must be so."

We are in receipt of a very interesting proof from Colonel Waterhouse, of Calcutta, as the result of his recent experiments in producing an etched plate by

the reversed negative process. We expect a paper from Colonel Waterhouse on this subject for the "Annual," which will be sure to prove of great interest.

We quote from a letter just received from M. G. Lippmann, regarding his experiments in the photographing of colors, the following: "As things stand now, the results are still far from practical. They extend only to the photography of the *pure* spectrum colors, and have not been extended to the composite colors, reflected by pictures and natural bodies. Even as it is, the experiment is still so delicate as to require the care of an experienced scientist. I quite hope, however, to bring them out of this embryo stage."

We note in the accounts of the dreadful disaster off Gibraltar, in which so many lives were lost by the sinking of the steamship *Utopia* by an English iron-clad, that our good friend Mr. W. Townsend Colbron, who was a passenger on the steamer, was saved by the Blue-jackets of the ironclad. Mr. Colbron was the first president of the New York Camera Club and an enthusiastic amateur photographer. We had the pleasure of presenting his portrait to the readers of the Bulletin last year, and would now extend to him and his family our sincere congratulations on his fortunate escape from a watery grave.

G. M. Elton, of Palmyra, N. Y., who has so often taken gold medals for his genre pictures, has just sent us a copy of one of his latest efforts, entitled "Grandpapa's Glasses," which is fully up to his best work, and in strength of modeling surpasses all his previous efforts. We will not try to give an idea in words of the artistic merits of the picture; it is too full of life and feeling to admit of any such description. It is one of those pieces of genre study that must be seen to be appreciated. At an early date we hope to be able to illustrate the Bulletin with some of Mr. Elton's work.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Dr. Lippmann's Photographs in Natural Colors.—The Actinic Intensity of Daylight—Photography in the Courts.—How to Photograph the Larynx.

Everybody speaks at present about photography in natural colors and Dr. Lippmann, of Paris. I am asked: Does it amount to anything? My answer is: Yes, it does! But I will not assert herewith that all the present photographic systems should be overthrown thereby. By no means! It may perhaps require several years yet to turn the new invention to practical use, a great defect of the same being that Dr. Lippmann can apply only very thin transparent films, which on account of their thinness have very little sensitiveness. With our ordinary thick plates colored results cannot be obtained. To be sure, two lady retouchers, frightened by the new invention, have come to me already and wanted to know if it would interfere with their vocation. I told them to call again in a few years.

I have not seen any of Lippmann's pictures yet, but he writes to me personally about the same:

"The plates are to be looked at in diffused white light, in slanting direction and upon dark background. It is a settled fact that the spectral colors are fixed

brilliantly and light-constant. As latest proof I have projected my spectra by means of electric light at the last session of the 'Société de Physik.'"

His explanation agrees fully with the theory of the color formation of thin sheets as already given by Dr. Zenker, 1867, in his photochromy for the explanation of the formation of colors by Niepcé and Poitevin and his own experiments, and as recently confirmed by Dr. Wiener, who proved by photography the formation of constant vibrations of light. The circumstance only is mysterious, that the colors by transmission are complementary to those by reflection. This fact needs still an explanation. Vidal has seen Lippmann's pictures and confirms fully the aforesaid. He says also that the plates are orthochromatic, even red-sensitive. All previous experiments about color photography had the one defect, that the films used were too thick, dark and opaque. Thus colors of impure condition would connect with the colors of thin sheets, the latter forming only superficially. During fixing the impure means (unchanged chloride of silver, etc.) were destroyed, but thereby also the color-thin sheets. These did not enter into action, because the film was not thin.

Wiener was the first one who applied very thin photographic films and produced in them visible standing waves. Lippmann's films are also very thin and transparent; thereby he excluded the colors of impure means entirely, and obtained, by fixing, the formation of the films, which in a thin film produced the colors of thin sheets. Former experimentalists applied further browned films, because these alone would show sufficient color-sensitiveness, but rendered difficult by their inferior transparency the formation of standing waves; they ignored also the importance of the mirror (with which Lippmann obtained principally his sample), notwithstanding Zenker's theory. On daguerreotype plates this existed. The color photographs were therefore obtained much handsomer on these, and it is not surprising any more if by chance a daguerreotype would originate, which showed the colors of nature. The proper experimental conditions (thinness of film, etc.) would have been met with, without the slightest idea or expectation. The great non-sensitiveness depends upon the strength of absorption. The more the light is absorbed, so much more powerful is the chemical action. The thin transparent films will therefore never excel by particular sensitiveness, and strong light-forces are therefore necessary (solar-light, electric light) to produce the said colored pictures.

To give Lippmann's explanation of the color-formation by standing vibrations is very likely not necessary any more, as undoubtedly it will have reached the United States in advance of my letter.

The mirror behind the sensitive film (for the production of standing waves), so important for Lippmann's experiments, was also applied by Dr. Wiener already in 1890 for the same purpose. But he was satisfied to furnish proof for the formation of standing waves, which has still a good many doubters. Practical use he did not make of the same; but Lippmann has done it, and with success.

How long shall I expose? This is an important question, which occurs to each professional and amateur a hundred times, and to which the most experienced has only an uncertain reply. The best answer is: Over-exposure is better than under-exposure, because over-exposure can easily be corrected by development, but under-exposure only with difficulty or not at all in spite of all "rapid developers."

The question about the correct time of exposure is so much more difficult to answer, as we possess no means at all to determine the chemical action of daylight, or, conversely, the sensitiveness of dry plates with certainty. Bunsen and Roscoe have tried to solve the question by many difficult investigations. Their tables about the chemical light-intensity at a certain height of the sun can be found in all text-books; but we have to say, with regret, that now they are almost valueless. The investigations of Roscoe and his scholars have proven that at the same height the chemical strength of light may differ extremely at different places.

We will gain information only about the chemical brightness of daylight, when a great number of meteorological observations about the same have been made from time to time. Our meteorological stations record daily thermometers, barometers, anemometers, but the practically so important chemical brightness they disregard entirely.

It is a strange territory to them.

Roscoe and Thorpe have conducted with the greatest zeal, and at different places, the investigation method introduced by the former (exposure of chloride of silver paper and determination of time necessary to obtain a certain degree of coloration).

Unfortunately not much has been gained thereby; the said chloride of silver paper is essentially violet-sensitive, and they have not measured the chemical brightness of the whole daylight, but only the strength of the violet light. This is of value for the positive process, but not for the negative process, when for the modern dry plates the light-blue (wave-length 450) comes in consideration as strongest acting place; for the silver eosin plates, which as color-sensitive are mostly applied, also the place wave-length 580.

The excellent Professor L. Weber, in Kiel, the first photometrician, has now occupied himself with the measurement of the brightness of daylight, and publishes daily observations about the same in the *Kieler Journal.* Unfortunately Professor L. Weber determines only the joint total brightness caused by sun and air. This is only of use for landscape photography. For portraiture and most of the other photographic branches the sun is excluded as much as possible, and in so far it was to be desired that the sun brightness and atmospheric brightness would be measured separately, particularly as both show surprising differences.

Dr. Weber says: "If the total atmospheric quantity is measured, which falls upon the surface of the earth, this will consist of the direct sun rays and the reflected light diffused on the firmament, and here it shows that the coloration of this total light depends only in a very small degree on the solar height."

This sentence may easily be miscomprehended. The brightness rises and falls considerably with the solar height. But this is very different in coloration (value of green, yellow, red and blue light).

Ordinarily one says that the orthochromatic action is greater toward evening or morning than noon; but this only correct for the direct solar light, not for the atmospheric light. This becomes so much richer in blue rays, according to the decline of the sun. In the light of twilight the red rays are extinguished almost entirely.

Some new cases of the application of photography in the service of criminal justice were shown by the chemist, Dr. Jesrich, at the session of the Polytechnical Society on the 19th of March. Photography has conquered a wide field in

legal matters. The advantage of a "Criminal Album" is recognized everywhere; the designation of the location of crime is urgently demanded; and a photographic picture of the results of chemical and microscopic investigations of objects connected with criminal deeds increases the estimate of these objects, which hereby are introduced to non-chemists in a comprehensive form and furnish at the same time a valuable proof. In many cases it has only been by means of photography to convict the accused, or otherwise to acquit the innocent. A man was accused a short time ago of having murdered a girl. A hair was found on the shoulder of this girl which resembled the hair in the beard of a man. But the picture, 1,600 times enlarged, showed distinctly that it was the hair of a dog, and the proprietor of the animal was afterwards discovered as the perpetrator of the crime. In another case a struggle had taken place between the murderer and his victim, a woman, in which both parties lost some hair. Here the photographic determination of the hair led to a direct conviction of the accused. The murderer was a man with bald head, and the hair found in the hands of the woman showed none or only a very small root, so that Dr. Jesrich, without having any knowledge of the bald head, pointed to the probable presence of such a one in giving his opinion.

The further investigation confirmed the identity of the hair with that of the man. On the other side hair was found on the accused, which by the shape of its root and the sharp points proved to be the hair of a female. A comparison of the photographs showed here also the identity. Photographic enlargements of the traces of blood denounced another murderer. The accused asserted to have received the blood spots while killing a goat, and he had proven that he actually slaughtered such an animal. But the photographic picture showed the presence of human blood besides that from the goat. Both kinds of blood can easily be distinguished in the 10,000 times enlargement by the quantity and shape of the several small blood bodies, of which $4\frac{1}{4}$ to $5\frac{1}{2}$ millions are contained in a cubic millimeter, while the blood from the goat shows a considerably smaller number and of irregular shape. The blood of the elephant and camel is the only one resembling the human blood. The birds have no round but oval-shaped blood bodies.

Interesting is also the discovery of counterfeit documents with the aid of photography. The several tints appear very different in the photographic picture according to their chemical composition, and counterfeits can therefore be determined very easily. Upon the death of a farmer a note was shortly thereafter presented for 20,200 marks. The heirs knowing that the deceased owed only 1,200 marks, the note was photographed, and then it proved that the first 2 had been added and that the 1 had been changed to a 0, the second 2 remained unchanged, and the two last 00 were inked over so as to resemble the first 0. Pretty badly a man fared, who on account of a foolish counterfeiting operation had to be an inmate of the States prison for eight months. He had been subpœnaed to appear in court on the 21st of the month, but had neglected the time, and to excuse himself he had changed the 21 to a 24. In another case a creditor obtained a receipt by taking an old receipt and changing the year from 1881 to 1884.

What a significance photography has attained at present in medicinal circles is proven by the following paper from Dr. B. Riesenfeld, Breslau, about photography of the larynx.

Already the inventor of the larynx mirror, Czermak, has tried to fix photo-

graphically the picture of the larynx in a live state. Proceeding from the autolaryngoscopy, his experiments failed, as did all of those who followed him in the same way, like Stein. Franck, in Brooklyn, had better success, and also Brown and Beduke, who worked together, but their methods were without practical value, because they required too complicated and expensive instruments and attendance by several persons. The essential condition for a good result should be a simple apparatus, to be handled only by the physicians.

The success of a photographic view of the larynx presupposed two conditions: a very light and chemically active light source, and a very short exposure. Gas and kerosene light should be excluded as light sources with consideration to the time of exposure; solar light, because it is not at disposal; and electric incandescent light, on account of its high price. The only remaining light source is the magnesium light. The larynx when alive is never quiet; the slightest breathing moves it, and all photographic views of the larynx should therefore be instantaneous.

Dr. Riesenfeld has occupied himself for a long time with experiments of this kind, and he has always applied the magnesium flash light without having obtained any result worth mentioning. The reason for this was, that even when he had the picture of the larynx in sharp focus on the ground glass, it was beyond his control to have the mirror always in the proper direction at the right moment, and that it was difficult to ignite the flash light in such a way that it fell as reflected light fully into the mouth of the patient and upon the larynx mirror.

In the Berlin clinical journal of December, 1890, appeared now an article by Dr. Richard Wagner, in Halle, which mentions a very ingenious invention and still very simple process, to photograph the larynx by eliminating the above defects. In place of the magnesium flash light he applies the light of the magnesium ribbon which is moved by clockwork. This admits by its bright illumination a sharp focusing and also the working of the instantaneous shutter at any desired moment, therefore particularly at the time the picture of the larynx becomes visible. To know when this takes place, Dr. Wagner has placed in front of the reflector, opposite to the mouth of the patient, a small plain mirror, movable in all directions, and opposite to this first mirror a second one of the same kind near the mouth of the patient. It is clear that the picture of the larynx will reflect in the first mirror, and at suitable angular direction can be observed in the second mirror. This would accomplish the most important condition for a photographic view of the larynx: to know how to hold the larynx-mirror that the picture of the larynx appears upon the ground glass.

At this part of Dr. Wagner's work there was still a great gap. He asserts that it was only necessary to focus the uvula sharply and to disengage the instantaneous shutter at the moment the picture becomes visible upon the ground glass. If we follow these directions strictly we will never obtain a picture of the larynx. The larynx, that is the human ligaments, are on an average 8 cm. below the uvula. It is clear that if the focus is taken upon the latter, no picture can be obtained of a formation 8 cm. below or behind the same (by reflection). It can easily be proven that if one approaches so near to the patient with the apparatus as Dr. Wagner, the camera requires to be considerably less drawn out when focusing the larynx, than by focusing upon the uvula. Dr. Riesenfeld uses for his experiments an aplanat of Hermagis of 19 cm. focal distance. For this

lens the difference of the bellows length, by focusing upon the two different points, averages, according to a large number of experiments, 46 mm.

It is therefore not sufficient, when Dr. Wagner says: "It is, of course, preferable to have professional help, who can take a sharp focus of the larynx."

At such a short distance of the objective from the ground glass it was impossible to focus simultaneously upon two points one 8 cm. behind the other.

With consideration of this circumstance—that is, at sharp focusing of the larynx itself—the method mentioned by Dr. Wagner was certainly the most simple, and after many ineffectual attempts the first one by which photographic views of the larynx could be taken at once.

BERLIN, March, 1891.

THE APPLICATIONS OF THE CARBON PROCESS TO THE INDUSTRIAL AND DECORATIVE ARTS.

BY P. C. DUCHOCHOIS.

(*Continued from page* 114.)

CARBON PHOTOGRAVURE PROCESS.

To engrave in half tone in the aqua-tint manner, the copper plate, free from scratches and well polished, should be first grained and the transfer made on the particles of copal. This method can also be employed to obtain relief engraved plates; moreover, there is less danger of the gelatine film blistering and the etching fluid finding its way under it, which would spoil the plate past remedy if the etching action be not stopped in time.

The proofs should necessarily be negative—that is, printed from a diapositive—for in the process we now describe the pure whites are represented by the surface of the metal when the plate is engraved, and before etching, by the resists formed by the insoluble gelatine. As to the operations, they are conducted as explained before. It must be said, however, that we found an advantage to add a certain quantity of alcohol to the etching fluid in order to cause the gelatine film to resist for a longer period the action of the same. It is true that a strong solution of ferric chloride hardens and makes gelatine insoluble, but by the addition of alcohol we think that the biting-in proceeds somewhat more regularly.

On no account, except in the case pointed out in the following lines, should the etching fluid be diluted, for then it acts with an uncontrollable energy. When compounded with alcohol it may be prepared according to this formula:

Ferric chloride, saturated solution	25 parts
Alcohol, 95 degrees	20 "
Water	100 "

During the action the etching on the parts corresponding to the blacks of the image is quite rapid. It is therefore important to watch it attentively, for it may happen—and this is indeed of frequent occurrence—that certain parts in the lights are not acted on quick enough, they hang back, so to speak. In such a case it is necessary to wet them with a brush imbued with a diluted solution of the etching fluid in order that they be etched more rapidly, for the less concentrated the ferric chloride solution, the more energetic its action, and *vice versa*. As before stated, 45 degrees Baumé is the standard degree of concentration of the aqueous solution.

If by this means it is seen that the parts in question are still not acted on with sufficient rapidity, one should proceed nevertheless, and when the plate is well bitten in the other parts (which is generally done in eight minutes about), the plate being rinsed and dried, they can be worked up with the diluted solution to which may be added 1 or 2 per cent. of hydrochloric acid. These local etchings are of great use to obtain more brilliant effects.

When describing the photo-typographic process we advised the operator to prepare a semi-transparent or little tinted tissue, as it is not to be found in the market. By using it one can regulate the biting-in with a very great ease, for as soon as the dissolving action commences the image can be seen to progressively appear with a brown color, first in the deep shadows, then in the half-shadows, etc., while by using the tissue manufactured for the ordinary purposes of photography, the black pigment does not allow one to follow the progress of the operation, especially in the delicate shades in the high-lights which are formed by the most opaque parts of the film.

The photogravures produced by means of the above carbon process are fair, but not as perfect of course as those obtained by the three-impression method or that of the three diapositives, for the biting-in being done in one operation the hollows cannot be graduated to color the image and impart to it the contrasts necessary to obtain vigor; and although this can be done to a certain extent by the *tour de main* described to force the parts not bitten-in in time, one must often have recourse to the engraver to finish the plate.

About three years ago a photogravure process was published, consisting in printing from a collographic film impressed under a diapositive three graduated proofs, one representing the blacks of the picture, another the half tints with the blacks, and the third a complete and perfect image, which were successively transferred on the copper plate, then grained before etching, that is on the transfer. This process, whose principle is the same as that of the method by three impressions, is quite ingenious, and doubtless yields excellent results; but it is quite complicated, and for this reason not very practical, requiring first to prepare a good printing collographic plate, pulling the graduated proofs, etc. The registering of inked transfers is also a difficulty, not very great, it is true, in operating by the dry method, but nevertheless a delicate operation. We have not tried the process. But while writing this paper it occurred to us that a similar method could be devised with three carbon prints graduated in the manner in question.

The three sheets of tissue should be a little smaller than the copper plate, each one cut exactly of the same size and in the same way, so that, when damped, the proofs stretch one like the other, either length or cross way. The reason explains itself. However, as the stretching of the paper, if not well sized and calendered, may be irregular or considerable, we would advise to render the paper impervious to water, or nearly so, by coating it both sides (by immersion) with a solution of india-rubber, and this done to coat it with the gelatine mixture. It is not at all necessary for developing that the paper be permeable, because the film being thick—and this purposely—the gelatine is never acted on through its whole thickness during the exposure-time, and consequently the heat of the water used for developing is sufficient to dissolve the under part and permit one to strip off the paper.

Now, three sheets of tissue, prepared and cut as above stated, being impressed

under a diapositive, so that by graduated and increased exposure-time the first reproduces the blacks and half blacks of the picture, the second, the middle tints, and third, the whole and perfect image, the first proof is transferred on to the polished copper plate, alumed, dried, and upon it a grain of copal—or rosin—is deposited, fixed by heat, and when the plate is cold and the reserves stopped out it is etched for a certain period—say three minutes—with the ferric chloride solution at 45 degrees Baumé, whereby the blacks are partly engraved. This done the plate is cleaned with the proper care, and the second transfer effected, etc., in operating in the same manner, but etching for a somewhat longer period ; the middle tints are then engraved and the blacks deepened. Lastly, the third proof, upon which the whole negative image is printed, is transferred, always proceeding as before, but etching for still a longer period on account of the little permeability of the parts corresponding to the shades in the whites. But it would be better to grain the plate in place of the third transfer.

As to the registering, it is done in the most simple manner, by tracing on the upper safe edge of the cliche three black crosses, one in the center, and corresponding lines on each sheet of tissue; this will serve to register for printing. To register on the copper plate, crosses are traced on the upper margin of the plate with the graver, the center one being the guide, and those on the sides serving to secure parallelism.

This process is no doubt complicated, but we think it is worth trying, nevertheless.

(*To be continued.*)

[*From Photographisches Wochenblatt.*]

DR. MIETHE'S NEW MAGNESIUM FLASH LAMP.

BY DR. J. M. EDER.

To obtain the best illumination effect of magnesium flash lamps it is important that the flame possesses great expansion, and that it consumes the magnesium powder as well as possible.

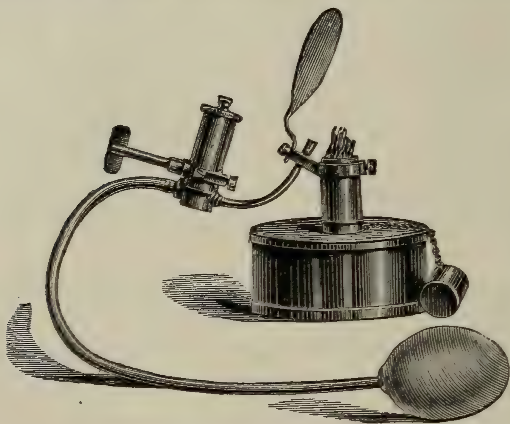
To obtain these effects Dr. Miethe constructed a lamp of the design seen in annexed figure, on which, at a suitable height above the flame, a round piece of sheet copper is fastened, which inclines at an angle of 45 degrees toward the flame. The flame touches the copper, and is thus forced to spread out fan-shaped. If magnesium powder is now blown into the flame from below, the greatest part will be consumed in the lower and middle portions of the flame, while the unconsumed powder rebounds from the copper sheeting and reaches the fan-shaped part of the flame, where it also is consumed. The lamp, which is well nickel-plated, is filled with alcohol before being used, and the wick is pulled out sufficiently and spread so that a wide and high flame, reaching to the copper sheeting, will result when ignited. If the wick is too small there is danger that the magnesium powder blown out of the tube will pass the flame unburned.

The arrangement for the introduction of the magnesium powder is very simple and practical. A capsule, that can be closed with a cover, is filled with magnesium powder, and this drops into a tube provided with a faucet. As soon as a filling is to be introduced into the lower blow-pipe, the faucet is turned.

The powder will drop thereby into the blow-pipe, and closes simultaneously the upper magnesium capsule, which serves as a magazine.

To blow the magnesium into the alcohol flame, the rubber bulb must be pressed quickly.

If a second magnesium flash is to be produced, a turn of the faucet and slight tapping on the magazine is sufficient to effect a new filling. The ordinary



filling takes about 0.1 gram magnesium powder, but more magnesium can be introduced by repeated opening of the faucet, up to 0.3 gram.

The filling with 0.1 gram magnesium powder burns, according to my experiments, in one-seventh second on the average, and develops the brightness of about 3,600 candles (amylacetate candles) if the chemical illuminating power is determined by means of bromide of silver gelatine.

The filling of 0.3 gram magnesium burns in one-fifth of a second, and furnishes a brightness of about 100,000 candles.

If portraits are to be taken by flash light, two or three such lamps can easily be combined without any difficulty.

The tests have shown, therefore, that Dr. Miethe's magnesium flash lamp exercises its functions very well, and develops a great chemical illuminating power during the short duration of combustion of one-fifth to one-seventh of a second, and that it can be well recommended for photographic purposes.

PHOTOGRAPHIC SHUTTERS.

BY FRANCIS BLAKE.

[Paper read before the Boston Camera Club.]

(*Continued.*)

I.—Common Wooden Guillotine Drop Shutter, with four rubber bands.

1¼-Inch Slot Passing 1¼-Inch Lens.

First test	0.009	second.
Second test	0.009	"

This shutter passes only 50 per cent. of the light which would fall on the lens if it were wholly uncovered during the action of the shutter. Moreover, it is highly objectionable on account of the violent jar it gives to lenses, often reducing the balsam with which they are sealed to a fine powder.

II.—Gregg Shutter.

Front of No. 3 Euryscope Lens. Spring wound two turns.

First test	0.034	second.
Second test	0.035	"

III.—Prosch Extra Rapid Shutter.

Attached to 00 Euryscope Lens. Fastest speed.

First test	0.0028	second.
Second test	0.0027	"
Third "	0.0021	"

This is a special form of shutter in which a single narrow radial slot passes across the center of the lens tube. So little light is passed, that I cannot regard this shutter as of any practical use.

IV.—Hoover Shutter.

3 D Dallmeyer Lens. *d*/0 is the full and *d*/8 the smallest opening.

	Quickest speed.		Slowest speed.	
d/0	0.058	second.	0.195	second.
1	0.043	"	.....	"
2	0.036	"	0.130	"
3	0.031	"	.....	"
4	0.025	"	.....	"
5	0.022	"	.....	"
6	0.017	"	.....	"
7	0.013	"	.....	"
8	0.008	"	.....	"

For want of light, anything less than *d*/3 would be of no practical use; so that the quickest effective speed of this shutter may be placed at 0.03 seconds, with a range up to 0.20.

V.—Hoover Shutter.

Large size made for Falk, the well-known professional photographer, of New York.

Euryscope No. 6 Lens.

	Fastest. Second.	Slowest. Second.
d/1	0.055	0.146
4		0.096
5	0.029	.....
7	0.017	.....

VI.—Prosch Duplex Shutter.

3/D Dallmeyer lens. Full opening about equal to d/2.

	Fastest Speed. Strong Spring. Second.	Slowest Speed. Weak Spring. Second.
First test	0.0164	0.0302
Second test	0.0167	0.0288

VII.—Prosch Duplex Shutter.

Euryscope No. 2 Lens.

Notch.	Strong Spring.	Weak Spring.
I	0.021	0.032
II	0.016	0.028
III	0.013	0.027
IV	0.012	0.026
V	0.010	0.025

VIII.—Prosch Duplex Shutter.

oo A Euryscope lens. Strong spring.

The tests with this shutter were very interesting, as they disclosed a second exposure due to the rebound of the shutter wings after closing. Mr. Ed. H. Lyon had been unable to obtain satisfactory pictures with this shutter, and returned it to the makers immediately after the tests. The reputation of Messrs. Prosch & Co. for good mechanical work renders it almost unnecessary to remark that the subjoined results are unique.

Notch.		Second.	Time from beginning of First to end of Second Exposure. Second.
I.	First exposure	0.0122	0.0262
	Closed for	0.0036	
	Second exposure	0.0104	
II.	First exposure	0.0100	0.0219
	Closed for	0.0030	
	Second exposure	0.0089	
III.	First exposure	0.0084	0.0190
	Closed for	0.0029	
	Second exposure	0.0077	
IV.	First exposure	0.0077	0.0169
	Closed for	0.0031	
	Second exposure	0.0061	

IX.—Newman Shutter.

Attached to Beck lens. Property of Mr. W. G. Reed. Set at exposure marked 1/100 second.

First test	0.045
Second test	0.048

On February 3d of this year, I tested a number of market shutters which were sent to me for the purpose by our President—Mr. Sweet. Of them all, it seems to me that for "all around work," where the limit of speed is not desired, the Bausch & Lomb new style is the best adapted to an amateur's use. It is exceedingly well made, and has a very large range of automatic exposures extending up to two or three seconds.

X.—Bausch & Lomb. (New style.)

Full opening about $1\frac{1}{16}$ inch.

Graduated time.		Second.
$\frac{1}{100}$	First test.	0.016
	Second test.	0.018
$\frac{1}{50}$	First test.	0.050
	Second test.	0.043
$\frac{1}{10}$		0.047
$\frac{1}{100}$ (½ inch opening)		0.013

XI.—Hand Release, Brass Shutter.

Full opening 1⅝ inch.

First test	0.031 second
Second test	0.029 "

Shutter jars camera badly.

XII.—English Two-winged Shutter.

2 Rubber bands. Full opening 1⅝ inch.

First test	0.035 second
Second test	0.034 "

Shutter jars camera slightly.

XIII.—French Flap Shutter.

1 Rubber band. Full opening $1\frac{3}{8}$ inch.

First test	0.038 second.
Second test	0.035 "

Shutter jars camera slightly.

XIV.—Single Fan Shutter.

Full opening $1\frac{1}{2}$ inch.

First test	0.029
Second test	0.030

Shutter jars camera slightly.

XV.—Long Single-slot Shutter.

Full opening $1\frac{3}{4}$ inch.

One test .... 0.052 second.

XVI.—Round Black Brass Shutter.

Full opening $1\frac{1}{2}$ inch.

This shutter was so slow that the ball in both tests reached the box before exposure was finished. I estimate its speed at about one-quarter of a second.

XVII.—Plunge "Patent" Shutter.

Perken, Son & Rayment, London. Property of Dr. George D. Tarbell.

Fastest speed notch 5	0.054 Second.
Slowest " " 1	0.064 "

XVIII.—Haake & Albers, Frankfort a/M. Thury & Amey, Geneve, 645.

Euryscope No. 3 lens.

Received from Messrs. Benj. French & Co.

Fastest speed.	Second.	Slowest speed.	Second.
First test	0.009	First test	0.103
Second test	0.009	Second test	0.117
Third test	0.009		

An exceedingly well-made shutter, with a good range of automatic exposures.

XIX.—Prosch (Special) Duplex.

Made to order for Euryscope wide-angle lenses.

Time exposure, squeezing the bulb as quickly as possible	0.211	second.
Instantaneous exposure, direct compression of bulb	0.031	"
Instantaneous exposure, released compression of bulb:		
First test	0.020	"
Second test	0.021	"

This is a very conveniently arranged shutter, as it is attached to the front board of the camera, and carries on its front face a flange which receives any one of a set of wide-angle lenses.

(*To be continued.*)

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

[*From the British Journal of Photography.*]

"ODD JOBS."

BY EDWARD DUNMORE.

(*Continued.*)

Leaving architectural subjects, there are often odd jobs of photographing domestic animals, horses, dogs, cats, etc. These are all plain sailing for those who make a specialty for this class of work, but even the number of failures are considerable; but for those who only try occasionally, an unlimited amount of patience is required. Providing the light is good, with quick plates and a rapid shutter, it is easy enough to secure a sharp picture, but getting a proper pose is where the difficulty comes in. The photographer should know the different points of the animal he has to take; if he does not happen to be a judge himself, the study of good paintings will be of some assistance. A horse should never be taken directly broadside, or with the legs hidden one behind the other; neither should it be taken full front. No matter how sharp such a picture may be, it never looks well. The side should be always more or less in perspective, with the head turned slightly to one side, the legs separated, and the ears erect. In the hot weather, when there are many flies about, it is almost impossible to get a satisfactory picture. The animals are fidgety, continually twitching their tails, or shaking their heads, or moving in some way or other that is pretty well continuous, the chance for a satisfactory exposure is very small. Cool weather, with a good diffused light, simplifies matters considerably. Of course, it is a great thing to secure good definition, but it is not all. Expression is quite as important, and the artistic value of a photograph depends more on this than anything else. To be a successful portraitist of animals, the photographer must have a love for them. It is astonishing how soon a bond of sympathy is established between men and animals if man sets about it in the right way, and how such sympathy smoothens the otherwise difficult operation of taking an expressive portrait. In such hands they become tractable, and can be persuaded to do pretty much as desired. Horses are also much influenced by the tone of the voice, having very discriminating ears. A loud, rough voice, generally causes a frightened expression, not only of the face, but of the whole body, as may be noticed by the shifting of the legs and moving of the ears. That there is infinite variety in expression of animals is undoubted, and we need only to look at Landseer's renderings of them to see and appreciate their pictorial value. Horses who have brutal keepers are difficult to get to look right, and never if the man is in evidence. There are, of course, different temperaments. Some are naturally vicious, but none are so irredeemably bad as to be uninfluenced by kind and judicious treatment, which will, with the worst, have much more effect than any amount of savagery, which oftentimes is the cause of the ill-temper. It is not to be supposed that the photographer can revolutionize the character of an animal in the short time he has to deal with it, but no doubt a soothing, pleasant voice and manner will have considerable influence with almost any, and that a man naturally a lover of animals, will get along with them more satisfactorily than anybody else. This discriminating power is frequently not so much taken into account as it should be, and many failures may be attributed to it. Let it be remembered that a horse can see behind him without, or with only very slightly, turning his head, and has, moreover, very sharp eyesight, which

he trusts to more than to any other sense, which is to his disadvantage, accepting appearances for reality. A strip of painted canvas that a child could destroy would, to most horses, be a barrier as effective as a stout rail : they would not try to force themselves through it, but leap over it, if they tried to pass it at all ; but the probability is they would do neither, but trot round the apparent enclosure until they saw no obstruction, then quitely pass through. Acting on the knowledge of these peculiarities, it becomes more easy to deal with them. They are, moreover, possessed of considerable curiosity, and this trait is one of the greatest advantages to the photographer. An unusual noise will cause them to prick up their ears and look inquiringly for the source. This is the time for the exposure to be made. The mere shuffling of the feet on gravel is a good lure, and answers the purpose almost as well, if not better, than anything else. But whatever plan is adopted, let the plan be the only one, and avoid having any moving objects about at the same time to distract the attention.

Dogs are not quite so easily managed ; they are more knowing, and want a reason for what they are expected to do. If treated roughly, they usually slink about with their tails down, and a most melancholy expression on their faces; or they will lie down, with their backs towards your camera ; in fact, anyway contrary to that you require. As to getting a bright, earnest, inquiring look, that is out of the question. Dogs will generally run after anything running away—small dogs especially. Pretending to throw a stone or a ball will generally prove attractive for sufficient time to make the exposure. Large dogs, as mastiffs or St. Bernards, seem to despise the frivolity of this proceeding, and a chance of some other kind must be watched for. They almost always sit or lie down immediately they are requested to be quiet. They generally keep an eye on their master, and directly he comes to a rest they follow suit. To keep a dog on his feet his keeper must not indicate that he has come to the end of his journey, or must appear as though about to start on another. Making queer noises may elicit a temporary interest, but it soon loses its effect, and they tell you, as plainly as looks can, it's of no use trying to humbug them, and they act accordingly.

Cats are generally a great trouble to photograph anywhere, except in their own homes. If they are brought to the studio, the majority of them, as soon as at liberty, raise Cain and break things. As to getting them to stay where you want them, it is entirely out of the question. They will get under a chair, or behind a background, anywhere and everywhere but where they ought to be ; so unless the photographer requires an afternoon's practice in patience, he had better not have brought cats to the studio. The only way to get pictures of cats is to take them where they *voluntarily* settle down. They can be gradually induced to frequent some warm, comfortable spot on a table or some article of furniture raised some little height above the floor that will be in a suitable position for taking them. Trying to force a cat to do anything it is not inclined to is so much labor thrown away ; and the most *suave* and insinuating manners very often meet with an ungrateful return. Once frighten a cat, and you are its enemy for life. The best cat portraits are almost all chance ones. When pussy is warm and comfortable, with an appetite fully satisfied, you may make exposure after exposure successfully ; and a nice picture of cat and kittens is one of the most popular pictures you can take.

Just one more odd job, and that is having to copy an old oil painting *in situ*,

say on some staircase, where it has hung for generations. Here often the difficulties to contend with are frightful. The light is frequently bad and the space cramped, the slope of the staircase and the yellow-brownness of the picture to be copied adding to the trouble. I once had something of this sort to do in an old hall, and this is how I set about it. With some boards and boxes I levelled up the stairs for a platform, on which I placed a pair of steps, having measured the distance for focusing by trying on something else at the same distance. I arranged the camera as nearly opposite the center of the picture as I could judge (it was too lofty to reach and take the actual measurement), the camera being wedged up as level as I could manage it, the slide was inserted, and the exposure, which was over an hour, made. The result was fair, and that is all I could say for it; and there was a considerable amount of reflected light over the whole picture, and I had not accurately centered it, but being on a much larger plate than the subject actually required, and oval in shape, it was as good as I expected, and when finished did not look glaringly bad. At the same time such jobs are not those a photographer takes from choice, but occasionally turn up to vary the monotony of every-day work.

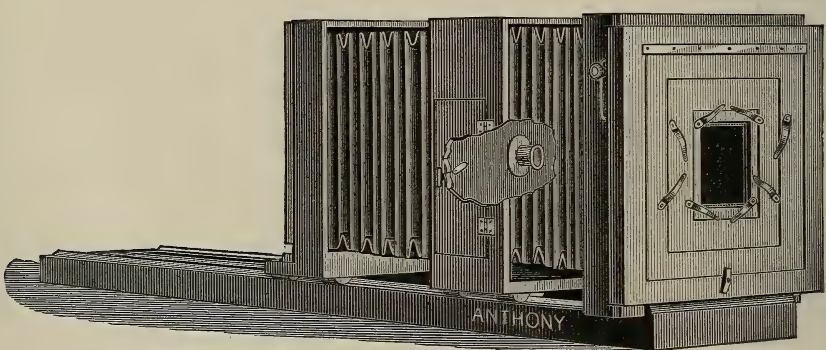
LANTERN SLIDES BY THE WET-PLATE PROCESS.

BY T. C. ROCHE.

(*Continued.*)

The negative to be copied should be fixed in a copying, or enlargement, camera. Such cameras are usually made with kits to hold the negative to be copied, and will take negatives of all sizes from 8 x 10 down to 4 x 5 inches. Quite recently a special camera for making lantern slides from 4 x 5 negatives, the usual hand camera size, has been designed and is made by the publishers of the BULLETIN. This latter is extremely convenient, and has every means of adjustment for centering the negative in order to secure a neat and artistic slide.

A figure of the larger variety of copying box is given.



The negative end of the copying box should, if possible, be pointed toward the sky. If this cannot be done, some means must be adopted to diffuse the light, to obtain even illumination of the negative to be copied. A good plan is to use an opal glass or white card as a reflector, or else to arrange a sheet of fine ground glass about an inch from the outside of the negative when in position in the copying box. Carefully focus the negative from the plate-holder end of the

copying-box, and put a sensitized wet plate into the plate-holder, attaching it to the box as usual.

The time of exposure will depend upon the light, the lens, the diaphragm and the density of the negative. With a lens of 8 inches focus and a quarter-inch diaphragm, on a clear day, and a fair average negative, twenty-five to thirty seconds are sufficient. Give full exposure at all times.

After exposure, the plate is taken to the dark room. Have enough of the following developer in a graduate to flow over the entire plate at one sweep:

Ferrous sulphate (iron photosulphate)	1 ounce.
Acetic acid, No. 8	1½ ounces.
Yellow rock candy	½ ounce.
Water	20 ounces.

Hold the plate in the left hand, and after sweeping its film surface with developer, keep it level and rock gently back and forth to insure even action of the developer. The picture will appear at once, and you must use judgment to note when to stop the action. As soon as all detail is out flow the plate with plenty of water in order to keep the high-lights clear.

After thoroughly washing, fix the plate with a solution containing:

Potassium cyanide	1 ounce.
Water	12 ounces.

Wash well again, and the slide is ready for toning. To obtain a blue-black tone, one of the simplest formulas is as follows:

Potassium sulphide	2 drms.
Water	10 ounces.

Put this toning solution in a dish and place the slide in it. The action is very rapid and gives good density. If you desire strong, brilliant contrasts allow the plate to remain in the solution until the action has penetrated the film through to the back, then wash well and set up in the negative rack to dry. If, instead of the above tone, you desire something warmer, use the following toning mixture:

No. 1.

Uranium nitrate	30 grains.
Water	5 ounces.

No. 2.

Ferricyanide of potassium (red prussiate of potash)	30 grains.
Water	5 ounces.

Equal quantities of Nos. 1 and 2 are mixed and flowed over the slide until the desired tone is obtained. Do not carry it too far, as it is apt to dry more intense than it appears when wet. If the warm brown tone is not suitable, it may be changed to a greenish-blue, by placing it, after washing well, into a bath of the developer and wait until the desired change takes place. Another handsome tone is obtained by using potassium permanganate solution, about 10 grains to the ounce of water, but the color is not very permanent. Gold and platinum toning baths can also be used, but they are too expensive.

After toning, all plates should be well washed; which with collodion films takes only a few minutes. After drying thoroughly, the slides should be varnished with Anthony's flint varnish or the diamond varnish.

Mercury for toning is not to be recommended for inexperienced workers.

For copying line work, such as engravings, where great contrast is required,

plates bleached in bromide of copper, then washed and dipped into a solution of silver nitrate, 15 grains to the ounce, and washed again, leave nothing to be desired. To produce fine work you must have the best of negatives. Foggy and bad skies should be stopped out with opaque.

NEW YORK CAMERA CLUB EXHIBITION.

THE second exhibition of the New York Camera Club was held at their rooms, 314 Fifth avenue, from March 4th to 21st. Profiting by the experience gained from the exhibition of last April, the exhibitors have prepared and placed on view some one hundred and sixty prints, which are all of excellent quality. The arrangement was all that could be desired, no exhibitor being able to complain that his picture was hung out of sight. With regard to the methods of printing, it was very noticeable that rough surface papers were in the majority. Printing on platinum paper, so general in England, is rapidly becoming popular in this country. The price is a serious drawback. One has, however, another process, easy of manipulation, which yields prints practically equal in delicacy and softness to the platinotypes. This is the kallitype process, a process dependent upon the reduction of ferric oxalate by light. Several very fine kallitype prints were on exhibition. Our old friend, the plain silver print, was shown to very great advantage.

The first to catch the eye were two surf views at Newport, the work of Henry R. Taylor. These are not new to many of our readers, but will always be admired as magnificent seascapes. Another frame by the same gentleman, "National Lawn Tennis Tournament," was an excellent portrayer of the capabilities of instantaneous photography.

Next in order was a capital group by the Club's president, David Williams. This was a group of three ladies and a boy, listening with rapt attention while an older lady tells them "The Catskin's Story." The whole of the posing and arrangement was very commendable, and Mr. Williams is to be congratulated on his successful models. The same gentleman also showed a large quantity of work on plain silver paper, work which could not fail to command admiration. Several of these were studies of colored lads, and remarkably successful they were. One, "Little Dunk," was a little colored urchin perched on a chest, the broad grin on his face testifying to his enjoyment of the situation. "Daddy Jack," was also a fine study of an old man taking a rest, his crutches being laid beside him. Mr. Williams' work on albumen paper and on landscape work will be remembered by all who saw his Alpine pictures last year. A series of "Virginia Scenes" fully sustained this gentleman's reputation, "At the Mill Door"—a horse, just released from the wagon, being stopped on his way to his noonday meal to allow his driver to indulge in a little gossip with a couple of mill hands, being very fine.

Five river studies, "Recent Efforts," by S. W. Bridgham, made a very effective frame, and some flower studies from the same camera gave token of careful work.

H. T. Duffield, as usual, came out strongly with his platinotype prints, and his kallitypes were simply marvels of success. This gentleman has a happy knack of getting lovely bits of woodland scenery, and, by careful development and printing, showing them off to the very best advantage. "Views on the

Bronx," "Road in Greely's Woods, "Ferry House" and "The Hutchinson River" were gems.

Portraiture received its due share of attention, Mrs. E. P. Lounsbury exhibiting quite a number, all of which may be pronounced of the highest merit. Jas. L. Breese again came to the front, and it is impossible to adequately praise his exhibit; indeed it was a feature of the exhibition. Miss Mary E. Martin's "Away in the Future" and studies in Greek costume were also very good. "Juliet" and "Waiting," by Dr. E. P. Fowler, were of the highest artistic merit.

Snapshots, by William A. Fraser, were very good, though two at least hardly deserved a place amidst such general excellence. Paul Tuber had quite a large exhibit, "Baby's Smile," "The Little Tom-boy" and "The Swan's Toilet," being very good.

Around the electric lamps were hung a large number of fine transparencies. The tables too were covered with prints and lantern slides, these latter being seen by the aid of an Anthony Lanternoscope. The exhibition was a decided success, the work showing a great advance over that of last year. The camera club works very quietly, but a careful inspection of the exhibit shown carries conviction that the work is done well.

WHAT MAKES THE DIFFERENCE.

To the Editors of the BULLETIN :

IN the February number of a Western journal appears an article, by one whose name frequently appears in the journal, advancing ideas which seem to me quite different from our general teaching, and also quite at variance with my experience.

Now I do not wish to take issue with the brother, but simply say his experience must come from working under very different conditions from those which surround me. The brother states that too warm a bath—not saying what bath, presumably the toning bath, produces measles. Now I think it is generally conceded that a warm toning bath is best. That it gives better results. Again he claims that if the paper is silvered the day before printing, the measles will not put in an appearance. Now my paper, the N. P. A., if properly silvered, will not measle, while if under-silvered it will be sure to have red measles, and if over-silvered there will be black measles, whether printed one day or a week after silvering. Using a hot or a cold bath seems to make no difference so far as measles is concerned. I prefer a warm bath.

Again the brother says: "the advocates of damping paper before silvering utterly fail to tell how it is done," and further that, "no one occupying the third floor can possibly dampen the paper in winter."

This to me seems queer, and I think if the brother would read the BULLETIN and "International Annual" he would see that at least some of the advocates of damping paper before sensitizing do tell us how to do it. Though I am of the opinion that too damp paper is the cause of much trouble, particularly when kept in a damp place too long, which sometimes occurs in long spells of wet weather where there is no fire kept in the room, yet I can tell the brother how I can dampen my paper, whether in the first, third or sixth floor.

Make a tight box, place a sponge saturated with water in the bottom of the box, some slats above on which the paper can rest; keep the paper in this

a while, and it will be damp enough, or even keep blotting-paper in it; then placing paper between these sheets of blotting-paper a short time will dampen it. Or pin two sheets of paper backs together, pinned by the corners, and hung in a box the same as for fuming, having a dish of water, or a sponge saturated with water, to take the place of the ammonia in fuming. Closed in this way will soon make my paper damp enough for me.

Now as the article in question appears to me misleading to the inexperienced, and as my age will soon exempt me from service, I wish to give my experience, which I can demonstrate any day to be true according to the conditions under which I am working. And in teaching I consider it essential that I produce all the evils which beset the printer as well as the operator, giving practical illustrations showing and proving by the cause and effect—thus enabling the student to avoid the difficulties which beset the inexperienced. P. Ersly.

A GOOD HINT.

To the Editors of the Bulletin:

Some time since I was calling at the gallery of a well-known photographer, and he called my attention to a small part of his room screened off from the remainder by an opaque curtain, tastefully arranged, and ornamental rather than otherwise. Withdrawing this curtain, I beheld a magic lantern on a stand, and at the other end of the compartment an easel holding a large white screen. He informed me that from every negative of a sitter of any prominence or position, he invariably made a lantern slide, and had it ready so that when they came to see either the proofs or receive the finished pictures, he exhibited to them on this screen the slide made from the negative, showing how an enlargement would look, and in very many cases it led to his receiving an order for a fine crayon portrait, and of course the other members of the same family must have them to match.

The expense attached to the making of the slide and fitting the place in reception room to exhibit same amounted to a very small per cent. on the receipts for the extra work induced by having the apparatus, etc., and proved a great source of gratification to even those who did not order enlargements. Mr. A. would hear that Mr. B. had ordered a large picture from his negative, and consequently Mr. A. desired to know what one of his own would cost, etc. Upon calling he would be shown how same would look, and in majority of cases result in an order.

Are there any others among your readers who have tried a similar experiment.

E. Beebe.

OUR ILLUSTRATION.

With this issue of the Bulletin, we present our readers with some more examples of Mr. H. P. Robinson's studies. Any words of commendation from us are uncalled for, as his achievements in this particular class of work are without a rival to-day. For those who may desire to possess silver prints of Mr. Robinson's studies, we would say that the publishers of the Bulletin are agents for Mr. Robinson in the United States, and can furnish all the necessary information in regard to size and price of the pictures.

ANTHONY'S
Photographic Bulletin.
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POSTAL PHOTOGRAPHIC CLUB.

THE club in its third year of reorganization, continues, with a full membership list, under the efficient management of Professor Spaulding and Dr. Mueller.

January and Februry albums include over seventy prints each. In the former Mr. Hausman shows two beautiful landscape platinotypes; Mr. Williams (recent vice-president of one of the English clubs) introduces his work with very pretty English country scenes, which he continues in the February album; as does also Mr. Walmesley his interesting microphotographic specimens; while in the latter book the club enjoys very well taken interiors of Vice-President Morton's and Secretary Wanamaker's Washington homes, as well as a study of Secretary Noble seated writing at his desk. These latter are sent by Miss Johnson, the latest member of the Postal Photographic Club.

BROOKLYN Y. M. C. A. CENTRAL CAMERA SECTION.

THE Central Camera Section of the Brooklyn Young Men's Christian Association gave a lantern slide exhibition on the evening of March 12th. The first part of the exhibition was devoted to a various collection of slides made by the members. The second part was a trip through Tarrytown and Sleepy Hollow, being an outing taken by the section last fall.

The secretary, Mr. Louis C. Bennett, gave a descriptive reading of the slides as they were thrown upon the screen.

ROCHESTER CAMERA CLUB.

ALL the meetings this year have been well attended, as well as interesting. Reports from the treasurer show the club in a prosperous condition. Many new members have been elected, and the resignations have been few. The club meets fortnightly, and at each meeting a demonstration is given. Among the latter of interest which have been recently given, may be named: "Snow Pictures," "Flash Light Exposures on Orthochromatic and Ordinary Plates," "Photography in England," etc.

Through the courtesy of the Boston Camera Club, we succeeded in securing the H. P. Robinson collection of English views, which has been admired so much in various cities; and, after a private exhibition to members, the president, who, by the way, is an Englishman himself, and a personal friend of Mr. Robinson's, gave an interesting account of the celebrated photographer's early efforts and later results; the club decided to hold the annual reception, and use the views to entertain the friends of the members. Accordingly Tuesday, February 10th, extra parlors were secured, invitations issued, and as a result, nearly three hundred ladies and gentlemen spent an enjoyable evening with the club. The pictures were so admired that, for the public's benefit, these views and the parlors were kept open three days and evenings, allowing a great many to admire the efforts of Mr. Robinson. Thursday evening, March 19th, the fifth and last of the series of illustrated lectures was given, entitled "Chicago." GEO. H. HASKINS,

Assistant Secretary.

ROCHESTER, N. Y., March 18, 1891.

BROOKLYN INSTITUTE—PHOTOGRAPHIC DEPARTMENT.

THE regular meeting of the above section took place on Tuesday, March 9th, there being a large attendance.

President BLACK introduced Professor T.

Lee Boyle, who spoke to the members on "Photography in its Relation to Art."

The professor wished it to be understood that he was not a photographer, but an artist, and he wished to draw attention to photography as considered from an artist's point of view. He did not believe that photography was a mere mechanical study, but that it was capable of exhibiting the soul and individuality of the operator, just as a musical instrument in the hands of a master could be made almost to speak.

It was well to know what could and what could not be accomplished, and thereby save much disappointment. He then described the way in which he went to work on a painting, taking that of a group in illustration, and dilated upon the difficulty of getting the apparently less important figures to properly harmonize with the central object. What attempts, erasings and second attempts before a satisfactory result could be obtained, and how all this is multiplied in photography when applied to such cases. He had seen single heads representing all the passions—love, hatred, jealousy, etc.—reproduced by photography most faithfully. But it was in landscape work that photography shone forth as being peculiarly adapted, though nothing but the finest apparatus in the hands of an artist could do full justice to it. One must have artistic knowledge to use this fascinating art-science to its fullest advantage. Photography had a distinct value and place of its own, and he looked on it as an assistant to the artist, enabling him to obtain in a moment what would otherwise involve days of labor.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

The Society of Amateur Photographers may well boast of its fine quarters. The rooms are spacious, and contain nearly every photographic requisite. The walls are covered with the work of the members, and this work, it is needless to say, is the best of its kind. By the aid of curtains and a square translucent screen, lantern exhibitions are made easy, the lantern and operator being out of sight and not hampered by the audience.

The regular monthly meeting was held on Tuesday, March 10th, President Stebbins calling for order at 8.30. Secretary Burton having read the minutes of the previous meeting, Mr. Stebbins gave a demonstration of the kallitype process. This process, he said, depends upon the precipitation of metallic silver upon paper by means of ferrous oxalate. Paper is coated with a solution of ferric oxalate and exposed under the negative. Upon those parts of the paper under the transparent portions of the negative, the ferric oxalate is reduced to the ferrous state. Paper so printed was shown. This is floated upon a bath of citrate of silver, and metallic silver is precipitated upon all parts of the paper where there is ferrous oxalate. One drawback to the process is that it stains the hands badly. After development, the paper is washed in citrate of soda and ammonia. Mr. Stebbins also showed a modification worked out by him, in which no silver is used in the developing bath. Several prints made upon this paper were exhibited.

Mr. F. C. Beach exhibited some specimens of "Composite Heliochromy" made and lent by Mr. Ives and described by him in a lecture to the Franklin Institute, as published in the Bulletin. Mr. Beach also spoke of the method of Col. Waterhouse for obtaining a positive from a positive. He had tried thiosinamine, but had been unable to achieve the desired result.

Mr. Stebbins had prepared some thiosinamine, and hoped to try it at an early date.

The meeting then went into executive business. The Secretary announced that since the last meeting four active and three subscribing members had been enrolled. The Board of Directors had also been considering the continuance of the *Journal.* A monthly report is to be published by the National Photographic Conference, which report would be sent to all the members of the society. Three hundred dollars had been dropped on the *Journal* during the year of its existence, and the Board recommended that this sum should be saved by discontinuing the publication of the *Journal* and consolidating with the conference report.

Mr. Dayton said that at present the conference simply was an institution on paper, and that their report was solely an advertising scheme; as he understood the matter, the report was to be published by a gentleman whose remuneration would be the advertisements he could get. Under such circumstances the society would have no control over it. It would, no doubt, publish whatever the society sent to it, but the other matter would be beyond the society's reach. It might even in time be controlled by some stock house. In addition, the society had large number of corresponding members, paying some $5 a year dues. The only benefit

these members derived was the receipt of the *Journal*. By joining the conference they could for $1 per annum receive the same and other reports, and this would probably lessen the number of such members.

Mr. Burton spoke strongly in favor of the conference, and said that all organizations at their commencement were organizations on paper only. The main fact was that the society would save $300 a year, and that the fact that papers read before the society would be read all over the country would act as a stimulant to members in the preparation of such papers.

On the question being put, the motion to discontinue the *Journal* and to use the conference report as a medium was adopted.

It was also decided to hold an annual dinner. The first, it was announced, would take place early in April next.

At the close of the evening a lantern slide prepared by Mr. Ives was shown on the screen, and also some colored Japanese slides.

The meeting then adjourned until April 14th.

LYNN CAMERA CLUB.

At a meeting of the Executive Committee, held February 24th, it was voted:

That the regular monthly meeting of March 3d be postponed to the 10th, on account of the repairs being made in the rooms.

That the members having lockers be notified to care for the contents, as the lockers are to be moved immediately.

That the second competitive exhibition of the club be opened on Tuesday evening, March 24th.

That the following rules shall govern the exhibition:

1. All exhibits for competition must be entirely amateur work by exhibitor.

2. All prints must be framed, and where frames contain more than one print, each print must be designated by a letter placed near the print.

3. There must be nothing on print or frame to indicate ownership.

4. Both negative and positive must be the work of exhibitor.

5. Negatives must be such as have never been used in a competitive exhibition.

6. Framed prints "for exhibition only" will be accepted, but frames must be so marked.

7. A silver medal will be awarded for the best bromide enlargement.

A bronze medal will be awarded for the 2d best bromide enlargement.

A silver medal will be awarded for best work as follows:

For bromide enlargement from hand-camera negative. For contact bromides. For silver prints. For miscellaneous prints. For positives other than paper.

8. The judges will be three disinterested parties, appointed by the committee.

9. All frames must be in the hands of the committee by March 21st, and the invoices of same by the 17th.

10. Bromide enlargements must be 11 x 14 or larger, and the invoice must state size of negative from which enlargement was made.

That a fine catalogue of the exhibition shall be published, and that the members must send in an invoice of the prints to be exhibited, as early as March 17th, and they are requested to send them in immediately if possible.

J. W. Gibboney,
Secretary.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A meeting of the above-mentioned society was held in the rooms of the Geographical Society, Nishikonyacho, Tokyo, on the evening of Friday, 13th inst., Mr. Edmond R. Holmes in the chair. There was a large attendance.

A paper was read by Mr. T. Ichioka on a certain developer that had fallen into his hands. This developer was sold commercially in the form of a bright red solution, needing nothing but dilution with water. It was exceedingly active, and could be used over and over again. It contained a large quantity of sulphite of soda, and some caustic soda, but Mr. Ichioka did not know what was the actual developer.

Mr. C. D. West thought that the actual developer was probably hydroquinone. Either pyro or eikonogen would be detected by the color, in spite of the fact that some dye, probably an aniline color, had evidently been added to the solution, to make it more difficult to guess what it might be made up of.

Mr. W. K. Burton demonstrated the washing of eikonogen that had turned quite black. By the particular method of washing adopted the loss of eikonogen was a mere trifle.

Mr. B. Munster showed some tubes of the new eikonogen developing powder. This powder was found to be quite white, and when dissolved in water gave a colorless solution. Mr. Munster said that it needed no ad-

dition of any kind, and was a most active developer.

A portfolio of prints that had been sent to the society some time ago by Dr. H. P. Emerson, as examples of "Naturalistic Photography," were handed round for criticism.

Mr. K. Ogawa said that when he was in America he had taken every opportunity of studying reproductions of the work of the French artist Millet, whose pictures he admired greatly. It was evident that Emerson was trying to imitate his work photographically; and, although Emerson's work was far from faultless, it was, Mr. Ogawa considered, a great deal better than what was commonly turned out by photographers, who might study Emerson's work with advantage.

Mr. C. D. West said he thought the greater part of Emerson's work was too black and sooty to be natural.

Mr. J. Milne recognized great artistic merit in Emerson's work; but, speaking not particularly of the specimens shown just now, but of Emerson's work in general, he could not see that it was necessary for a "naturalistic" effect to select, for photography, only such phenomenally hideous figures as were generally to be seen in Emerson's photographs. At least half of them would be arrested on suspicion, only on account of their faces, if they were seen by daylight. He proposed a vote of thanks to Dr. Emerson, which was seconded by Mr. A. J. Hare, and carried unanimously.

Mr. I. Isawa showed some excellent microphotographs, and gave a short description of the means of producing them.

Mr. Kajima Sebi photographed the meeting by flash-light.

The proceedings ended with a vote of thanks to the chairman.

During the evening prints made from negatives exposed on the occasion of the flash-light at Kaga Yashiki by Messrs. Kajima, West and Burton were exhibited. W. K. BURTON.

CALIFORNIA CAMERA CLUB.

THE first annual meeting of the California Camera Club was held in the new club rooms, Academy of Sciences Building, 819 Market street, Tuesday evening, March 3, 1891. *President* REED in the chair, *Secretary* ANDREWS at the secretary's desk. For the first time in the history of the club, every active member responded to the roll-call.

President REED rendered his annual report, which was replete with suggestions to the club to purchase a complete portrait outfit, the arranging for a series of field days, and a legitimate expenditure of the club's funds, so as to provide the new rooms with every convenience that will afford the experimental amateur photographer facilities for pursuing his work.

Secretary ANDREWS' report elicited the information that the club membership was 177, with but six resignations and two deaths during the year. Applications for membership on hand, awaiting the action of the board, 48. Money collected during the year, $1,843.95; expended $1,344.75; leaving a balance on hand of $499.20, with nearly $1,000 still owing the club. The club gave three public demonstrations during the year and several public exhibitions. The cost of these exhibitions averaged $100 apiece.

The election of the Board of Directors for the ensuing year was next in order, and resulted as follows:

President, GEO. W. REED (re-elected).

First Vice-President, H. B. HOSMER (re-elected).

Second Vice-President, E. P. GRAY.

Secretary, T. P. ANDREWS (re-elected).

Treasurer, E. J. MOLERA (re-elected).

Corresponding Secretary, E. L. GIFFORD,

Librarian, H. C. TIBBITTS.

THEO. C. MARCEAU (re-elected). C. J. WETMORE (re-elected). H. C. OWENS. A. G. MCFARLAND.

"A Dry Emulsion, Sensitometer No. 62," the illustrated poetical satire upon the club's prominent members, was shown upon the screen. Mr. Gifford, the author of this pleasing joke, read the poem. This proved a pleasant surprise to the members and their friends present and was highly appreciated. After this a batch of miscellaneous slides from various members were shown upon the screen. Following this the club members were invited to partake of a sumptuous repast, with the compliments of the new Board of Directors. The meeting then resolved itself into a smoking concert, during which the club was highly entertained by Mr. West, the famous banjo soloist, with an original song dedicated to the club; by Mr. Hirsch, the popular zither soloist; and by Mr. Bornemann and his little tin whistle. The entertainment was highly pleasing, and it is proposed by the club to hold a smoking concert once in two months. Mr. W. B. Lee, of the Boston Camera Club, and E. P. Gray, of the Amateur Photographic Society of New York, participated in the proceedings. T. P. ANDREWS,

Secretary.

Secretary's address,
333 Kearny street.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held on Wednesday evening, March 11, 1891, the *President*, Mr. JOHN G. BULLOCK, in the chair.

A report from the Committee on Lantern Slides was read, relating to the public exhibition held on the evening of February 20th at Association Hall, representing the work of members of the society. The exhibition was an entire success, being not only fully equal in artistic merit to previous exhibitions, but far exceeded any in its pecuniary returns. One hundred and ninety-one slides were shown by fifty-one members.

Dr. Mitchell opened the subjeet announced for discussion, "Dark Room Illumination," and exhibited a lantern which he used in his own dark room. The general objection to the illumination of a dark room by means of colored light, particularly ruby light, was that in a short time it generally affected the retina very injuriously, and really produced a form of congestion. It acted very strongly on the eyes of individuals whose retina was a little more sensitive to the colors to which one is limited in the dark room. The light was generally thrown directly in the face of the operator, or very nearly so, so that while looking at the plate he received, more or less, the red rays in his face—he wanted it on his plate—hence after some consideration he had had constructed for his own use the lantern now exhibited, in order to concentrate the rays solely upon the plate.

The lantern was a square tin box, with the ruby glass inserted in the bottom. The intention was to suspend the lantern above the developing tray, all light thus being shut out directly from the eyes of the operator. The light was furnished from an Argand burner. The doctor stated that he had worked for five or six hours at a stretch with this lantern without feeling any more effect than if he had been reading a book by ordinary lamp-light.

For the purpose of overcoming the shadow caused by the lighting apparatus, the president stated that he had used a lantern similar to the one shown by Dr. Mitchell, arranged for the gas to come in from the rear. He used a large fish-tail burner, placed parallel with the glass, and by that means avoided shadow.

Dr. Mitchell suggested that the most perfect thing would be a 10 or 15-candle-power incandescent burner, which one could readily turn on or off, as desired.

The doctor also exhibited the Aurora lamp, a smaller lamp of the ordinary form, which was arranged so as to permit the turning up or down of an oil light from the outside. The oil reservoir could also be taken out altogether for filling purposes.

A small lantern for use when traveling was next shown and described by Dr. Mitchell. It was lighted by means of a candle, and when set up was of a triangular shape, two sides being of tin and one of ruby glass.

In response to a reference by Mr. Cheyney to the Tisdell lantern, another form of tourist's lamp, Dr. Mitchell said it was a very good one for the purpose intended. He also spoke favorably of the W. I. A. lamp. The reservoir of this lantern contained a bed of cotton, which only required to be saturated with petroleum for use.

Mr. Carbutt here exhibited his lantern, with which many of the members were familiar. Its excellencies were made apparent by Mr. Carbutt. It had been in the market for eight years, and judging from the sales it must give satisfaction. He had made a few improvements from time to time as he found out the requirements. One was to have more holes in the bottom to give greater inlet of air.

Mr. Carbutt next referred to the lamp he used while traveling last summer. It was constructed on the same principle as the one shown by Dr. Mitchell, but in place of glass ruby fabric was used. He found it very convenient, as he could buy a candle almost anywhere.

Mr. Bell said that on his trips he never used a light at all. He closed up his room and changed his plates in the dark.

Mr. Rau described an Aladdin lantern which he had in his dark room, in which he burned sodium core. An orange chimney could be used, if desired.

In response to a question from Mr. Vaux, Mr. Rau said it was claimed that the sodium core would burn forty hours.

Dr. Mitchell alluded to a subject which he thought pertinent to the discussion on dark-room illumination—*i. e.*, the degrees of light which are thought to be injurious to the plate. Some operators thought it was almost necessary to develop and handle plates in Cimmerian darkness, so to speak, and it was a strain on the eyeballs to catch any sign of the image on the plate. He must say he was an advocate for plenty of light. He had always used a great deal of light for changing plates, and in the dark room for all purposes, and he had never seen any injurious results. It might not do for orthochromatic plates, but with

that exception he thought one or two thicknesses of yellow post-office paper, with a proper amount of care, would suffice for the most sensitive plate. A newspaper could be read by the light he had in his dark room, and it was much better to have plenty of light for all purposes. He developed right under the light, and had never had any fogged plates. There had been no changes made by the light, as he had repeatedly exposed part of a plate to the light, covering the rest, and the portion exposed showed no trace at all of the action of the light.

Referring to the method of development in ordinary light by means of "Nuktigonia," an orange-colored developing fluid, Dr. Mitchell said this was a solution of a very strong orange-colored aniline dye, and the plate had to be placed in the solution in the dark room, or in some way by which actinic rays could not reach it, but after that development could be conducted without any trouble. Some of the members might be astonished to learn that a plate of ordinary sensitiveness, after development had been pretty well carried on—particularly pyro development—could be taken out in a strong light and the plate finished.

Mr. Cheyney said there was one fact relative to light which was not often taken into consideration, and that was the operator's distance from it. The lantern he had was very convenient for developing, but the rest of the room was too dark to lay one's hand on a bottle or anything that might be wanted. To obviate this, he had a lamp placed about eight feet distant, to which was affixed a ruby chimney. This he found he could burn with impunity and have lots of light. None of his plates had been fogged by it, and he always used as fast plates as he could get.

Mr. Rau described an apparatus made by him for use while traveling in the East with Mr. Wilson. It consisted of a cylinder made by rolling several sheets of Carbutt's ruby paper on a stick. Whenever he desired to change his plates, he stood this cylinder over a light placed in a box lid, and though it lit up the whole room, he never lost or fogged a plate. Of course, they did not then use as rapid plates as at the present time. The cylinder did not break, and the same sheets were used during the whole journey—six months, probably. The light used was a candle, and the top of the cylinder was turned over.

Mr. Chapman described a method of lighting the dark room from outside, thus avoiding the discomfort from heat and exhausted air. The lamp could easily be placed on the window-sill outside, and the colored fabric against the glass, made to fit closely to the window frame.

Mr. Ives said he had several dark rooms in use, and wherever he uses artificial light he placed it immediately outside the window of the dark room, so that all the heat was out of the way.

Dr. Mitchell said he had noticed in the British journals, almanacs and year books, by several different authorities, that it was quite possible to change plates by candle-light. He did not know whether it was a yarn or not, but it was stated as a fact. The candle was placed in such a manner and so shaded that the direct light did not fall on the plates. It was stated the actinic light was so small that it would have no injurious effect upon the plates.

Mr. Ives said he had changed plates in that way a hundred times, and he had no trouble with the plates. Still, he did not think it safe to advise people generally to do this, but it could be done.

Mr. Wilson facetiously remarked that plates were very rarely fogged in the dark room anyway. It was usually the fault of the plate. (Laughter.)

Mr. Ives said it should be understood that most of the sensitive plates in the market were considerably sensitive to the true red rays of the spectrum. It was not a good idea to leave plates exposed to red rays for a great length of time. He knew, by experiment with some of the rapid commercial plates, that landscapes could be made by the action of the true red rays of the spectrum. With a rapid-working lens, and an exposure of about fifteen minutes, very perfect work could be done, and no rays acting except the true red rays. Such pictures he had made, therefore these plates should not be exposed to red light for an unnecessary length of time, otherwise it would be bound to produce some effect. With the orange light he knew that the picture could be made with a shorter exposure. Ordinary plates were least sensitive to the red, than to the orange or yellow—but sensitive enough to the true red rays of the spectrum to permit of a landscape being made with the exposure above noted.

The Secretary suggested that a shelf under the developing table was a very good way to cover up the plate. It was always there when wanted, and saved the trouble of hunting in the dark for covers, which could not be found when most wanted.

Mr. Ives used a hinged lid for this purpose,

which he turned down over the developing disk when he desired to cover the plate. He found it very convenient.

Mr. Earle showed an improved form of "diffuser" for flash-light exposure. It was the invention of a Mr. Bridges, of Baltimore, and consisted of a base of tin about 12 x 18, at one end of which was hinged a tin reflector of same dimensions, and at the other a frame holding a thin sheet of white translucent celluloid. The flash lamp, of any usual form, was placed in the middle of the base board, the light being reflected through the celluloid, which diffused it in a very perfect manner without materially lessening its actinic power.

Everybody predicted that the celluloid would burn up at once, but a very careful test had been made, and they found that the material could even be waved through a gas flame without ignition. It would ignite only when held still in the flame. Considerable heat was necessary to start celluloid to burning.

If a little common salt were added to the magnesium it would give a yellow flame, and by the use of an orthochromatic plate very soft effects could be obtained.

Mr. Earle also exhibited a small, old-fashioned wet-plate camera and dark room combined. The sensitizing, the exposure and the development were made in the same box. It was the invention of a Frenchman named Dubroni.

Mr. Browne created considerable merriment by explaining to the members the manner in which this box was intended to be used.

Mr. Ives said he had seen a similar contrivance, but a good deal more elaborate. It worked very well indoors, but in the open air the results were never satisfactory.

Mr. Vaux desired to call the attention of the members to an article, by Mr. M. C. Lea, in the last number of the *American Journal of Science*, on "Gold-Colored Allotropic Silver." The article had along with it three or four plates illustrating the very brilliant colors which Mr. Lea had produced in connection with his investigation. Adjourned.

ROBERT S. REDFIELD,
Secretary.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—J. H. C. writes: Please give me through the columns of the BULLETIN a formula for enameling photographs.

A.—To glacé prints, take any ordinary glass plate, soak it in nitric acid, and wash quite clean. When dry, rub it over with French chalk, and clean off the excess. Now coat the plate with Anthony's Glacé Collodion. Have ready a solution of French gelatine in water, kept warm in a hot-water bath. A solution of twenty grains to the ounce will do. Immerse the proofs in the gelatine solution while it is warm, and lay them down with the albumen side on the collodionized plate, rubbing out all air-bubbles with a squeegee. Let the whole dry, and then cut around the edges and peel the print off the glass. To keep full gloss in mounting, paste heavy plate paper over the back of the prints previous to stripping, and the pictures can be removed without losing gloss, and can be mounted on cards by touching the corners with glue. Use good white glue for the mounting.

Q.—E. G. E. writes: Will you kindly give me a formula for a good toning bath with a bichloride of platinum, instead of gold, as the toning agent.

A.—Platinum bichloride is not a good agent for toning, but the following bath is given by Lyonel Clark. Dissolve 60 grains of chloroplatinite of potassium in 2 ounces of distilled water. To make the toning bath take:

Stock solution......	1 fluid dram.
Nitric acid.........	3 drops.
Distilled water.....	8 fluid ounces.

Print deeply on mat surface paper; wash well and immerse in the toning bath. When the desired tone is obtained, throw the prints into cold water containing a little sodium carbonate. Finally, fix in hypo and wash well.

Q.—W. H. R. writes: I would like to know through the columns of the BULLETIN: 1st. Is there any silver in the fixed silver print? 2d. How many grains of gold chloride can be made from a five-dollar gold piece?

A.—Of course, there is silver in the fixed silver print; there would not be any image on the paper if no silver remained. The image is formed of metallic silver, and all other silver compounds are dissolved out in the process of fixing. Weigh a five-dollar gold piece, and for every 100 grains of weight there is 90 grains of pure metallic gold. The rest of the coin is copper. Every 100 grains of pure gold will give 154 grains of gold chloride. If crystallized gold chloride is needed, then 181 grains should be obtained.

Q.—J. H. writes: At the time that Lam-

bert was selling the famous carbon printing process, a patent was taken out by him on what he called "mineral paper," to be interposed between the negative and the paper, for the purpose of retouching on its surface, and for protection of the film of the negative at the same time. Would you kindly inform me through your columns if such paper is still on the market?

A.—Mineral paper as used by Lambert was gummed by the edges to the back of the negative, and the retouching was done on this back. The paper came in sheets 18 x 22, and is not now much in demand. We presume, however, that our publishers could get it for you.

Q.—C. H. C. writes: Will you kindly enlighten me in the next issue of your valuable journal on the following point: Some time ago, in an article contained in a photographic publication, the writer, in speaking of the merits of oxalate and iron developer for dry plates, stated as one of the points in favor of same that lamp-light unshaded by ruby glass or other screen could be used with perfect safety in the dark room during the development of plates. I was led to believe that the article meant, although it did not say so in so many words, that with this developer a ruby light was not necessary, any lamp-light being safe. Is this the case?

A.—We would not recommend the use of ordinary lamp-light for the dark room. We would also refer to the excellent discussion on this very subject in the report of the Photographic Society of Philadelphia in this issue of the BULLETIN.

Views Caught with the Drop Shutter.

TUCKER & BUTTS, the well-known photographic merchants, of Bufflalo, N. Y., had a narrow escape from fire on March 11th last. The building next door to them caught fire and burned to the cellar in fifteen minutes. The Tucker building was on fire several times, but the flames were soon extinguished. Some damage was done by smoke and water, but the loss was fully covered by insurance. We are glad our friends have suffered no serious loss, and that they are again doing business as usual.

THE CRANDALL TYPE-WRITER, which we have been using in our sanctum for some time past, has proved a decided success. We are able to do a great deal more work in less time than when we had to use our pen or pencil. It has given us so much satisfaction that we cheerfully call attention to its merits in this place. It appears to us that it is the best two-handed machine in the market. And its moderate price is not the least of its many good qualities.

W. S. BELL & CO., of Pittsburgh, Pa., were burned out on the night of March 11th. Their stock was completely destroyed. They are, however, going to continue business.

W. S. SUTTON, of Hornellsville, N. Y., had his studio damaged by fire on March 11th. The fire originated in the store below. Loss, four or five hundred dollars.

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CHILD STUDIES.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

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TEXTILE PHOTOGRAPHY.

THERE is, perhaps, no more beautiful application of the photographic process than in the decoration of silk, linen and other fabrics. The manner of carrying out the various steps of the operations is not difficult, and a plain discussion of them may prove profitable to many of our readers.

In the first place, suitable negatives must be selected for the printing, and in this matter more thought can be bestowed upon the subject than would at first appear.

Such objects as silk pocket-handkerchiefs and small pieces of linen should have dainty little landscapes printed in the corners. In selecting these care must be taken that the negatives used are strong in contrasts, as the surface of the fabric has a powerful softening effect when the printing is done in the best possible manner. As a consequence discolored and foggy negatives are entirely excluded. For larger objects, such as covers for the seats of chairs, tidies and small table covers, genre pictures, strong heads, interior views and architectural pieces form excellent subjects for decoration; but in all cases good clean and strong negatives are essential to success.

The first step to take in printing on any textile fabric is to put something on the surface upon which you are going to print that will as much as possible keep the picture on the surface. This is usually done with a solution of gelatine. A number of formulas are given in the various photographic books, but the following answers all practical purposes:

White gelatine	2 grains.
Water	1 ounce.

If the fabric is new it should be very carefully cleansed from all dressing. This is important, as the materials used to give a finish to fine linen and other materials of that character, often contain starch, gum, and substances that spoil the beauty of the finished silver print. The fabrics should therefore be carefully washed and rinsed in clean water. Under all circumstances thoroughly soak the

fabric in clean water, and squeeze out all the air in it before applying the above sizing solution of gelatine.

Having pressed out all possible water from the soaked material, immerse it in the above gelatine solution, press out any large excess and stretch it to dry. The stretching can be done in various ways according to the size of the piece of fabric in hand. With a pocket-handkerchief it is a simple matter. Take the lid off an ordinary round wooden box such as used for powders, and have the box of a size larger than the print you wish to make. Use the deep part of the box and stretch the gelatinized fabric over it, tying it down with a piece of string. If this is done when the material is wet, on drying the surface of the fabric will be smooth, provided the wet material was tied perfectly tight. To make the printing surface the following salting solution is prepared :

Ammonium chloride	5 grains.
Iceland moss	3 "
Boiling water	1 ounce.

Keep the above mixture warm until the moss is completely dissolved. Filter the solution, and when nearly cold spread it on the gelatinized fabric with a soft camel's hair brush, taking care to spread evenly and avoid air-bubbles. Allow to dry again. The sensitizing is done in the following silver bath:

Water	1 ounce.
Silver nitrate,	35 grains.
Alum	2 "
Nitric acid	2 drops.

Float the salted fabric on the bath for ten or fifteen minutes. A little practice is necessary with the bath to learn the right time to float. This will be secured by making a few experiments with prints on small pieces of linen prepared as above and tried before going on to any work that you would not like to spoil. After sensitizing and drying the fabric fume it in the usual manner and print deeply.

When printing care should be taken that the box carrying the fabric is firmly fastened to the negative. A good plan is to cut a hole in a piece of board that takes the place of the usual back of the printing frame, and such hole must be of a size to receive tightly the stretched fabric on the box. The board should also fit tightly into the printing frame, and the hole must, of course come over that part of the negative it is desired to print on the fabric. A couple of pieces of thin pine wood can be made to take the place of the brass springs of the printing frame, and two corks placed under them give the necessary pressure. Another plan is to place the board containing the sensitized fabric into the printing frame first in the usual place of the negative, then attach the negative to the frame by a hinge made of a piece of linen carefully glued to both frame and negative, and fixed in such a manner that it can be readily moved on and off the fabric without failing to register, this will give an opportunity to examine the progress of the printing from time to time.

When the printing is sufficiently deep, wash the material in several lots of water and tone in any good toning-bath, taking care to tone to a deep blue or black. After toning wash well and fix in hypo 1 in 4 for half an hour.

What we have said above appears long, but in practice the work is very simple, and when once the printing-frame or other arrangement is prepared for the purpose many pretty decorations can be made in an afternoon.

For large work, like tidies, a deep printing-frame to hold the stretched fabric, stretcher and all, may be used, and a test-piece, under a negative of the same density, in another frame will serve to time the printing.

EDITORIAL NOTES.

At a recent Jubilee of the London Chemical Society, some very interesting relics of earlier photographic chemistry were exhibited, among them being a photograph of the solar spectrum, taken by Professor Draper, and the first known photographs on glass made on precipitated silver chloride by Sir John Herschel, 1839. Also a frame of the early cyanotype prints and several other photographic processes.

A new method of retouching for platinum toned photographs, is to sketch in the clouds with a mixture of fine pumice stone and graphite, the same method has been employed on negatives and is said to work admirably.

We are in receipt of a very elegant little brochure from the Lynn Camera Club, which serves the purpose of a list of officers, etc., and also that of a catalogue to the second annual competitive exhibition of the club. It is very daintily gotten up, and the report of the exhibition which accompanies it, shows that the work of the club is steadily improving, and that general interest is active in its support. Several excellent half-tone prints serve to add to the interest of the catalogue. It is only a short time since the club regaled its friends with a most interesting lecture by F. W. Breed, Esq., on Norway, Russia, and the Passion Play at Oberammergau, which was illustrated by more than one hundred and twenty-five beautiful views, all of which shows that this club is wide-awake and progressive.

A new formula for hydroquinone developer which will not spoil by keeping, comes from Dr. O. Lohse, as follows:

Hydroquinone	7.5	grams.
Resorcin	.4	"
Sodium sulphite	30	"
" carbonate	20	"
Distilled water	1,000	cc.

We shall be glad to know the results obtained with this formula.

The annual meeting of the Photographic Association of Brooklyn, on March 9th, resulted in the election of the following officers for the year:

President, Dr. E. H. Riedel; Vice-President, E. F. Wagner; Secretary, Charles M. Heid; Treasurer, J. A. Gafney; Librarian, J. Sefrin; Chemist, Dr. W. Shade; Trustees, Dr. F. A. Schiltz, Dr. E. Schaefer, Charles Wapler.

We are much pleased to record the fact that our good friend, H. McMichael, of Buffalo, has been awarded a silver medal, the highest award in the genre class ot the Liverpool International Photographic Exhibition. From the fact that this

exhibition is held only once in three years, and that in this case, over forty foreigners competed, showing more than four thousand pictures, Mr. McMichael has reason to be especially elated. The press notices from the other side on the compositions entered by Mr. McMichael are very flattering.

We have received from Mr. Ford Lewis a copy of the Constitution and By-Laws of the Photographers' Association of Northwestern Ohio, by which, it appears, that Ford Lewis, of Celina, O., is President, R. H. Ebersole, of Lima, Secretary, and M. V. Gilbert, of Ada, Ohio, Treasurer.

The Albany Camera Club have just given a most successful lantern slide exhibition, showing work from the hands of its members entirely.

Recent experiments with magnesium flash and the spark from a Leyden jar, tend to show that the latter is infinitely more rapid than the former. A rapidly revolving wheel, photographed by each successively, appearing of a gray color by the former, but as if stationary with the latter. It has been thus demonstrated that the principal part of the duration of a single electric spark is only the twenty-five millionth of a second, while that of magnesium is from one-tenth to one-fiftieth of a second.

A soap-bubble has been photographed in the act of breaking, by dropping of weights from an electro-magnet, which broke the film and produced the light simultaneously. A small shot has also been passed through a soap-bubble, when the former was perfectly dry, without breaking the bubble, though if wet with alcohol it would break the bubble at once.

Mr. B. F. Stebbins, of Adrian, Mich., sends us data concerning the Adrian Camera Club, by which we notice that the President is B. F. Stebbins ; Vice-President, W. T. Barnum ; Secretary, E. J. Stebbins, and Treasurer, Walter Graves.

The Hartford (Conn.) Camera Club devoted an evening recently to the consideration of "Painting and Photography Contrasted," by Mr. Charles Noel Flagg, of that city, who claimed that one of the legitimate fields for artistic photography is, in its power to express original ideas of composition to the same extent as in painting, and advocating the frequent introduction of figures into landscape work.

Two remarkably fine Photographs of the bacillus supposed to be the cause of typhoid fever have lately been obtained by Dr. Charles M. Cresson, of Philadelphia, from drinking water—these he has enlarged to about 3,500 diameters, finding them to be not at all unlike dumb-bells in shape and appearance. The method of obtaining these specimens is to violently agitate the suspected water, and pour into a thoroughly clean glass receiver, which gradually tapers to a fine opening, which is closed with a faucet. After having settled for a number of hours, a single drop is allowed to escape on a glass and immediately examined under the microscope. Dr. Cresson's report, which he is now preparing, will be of great interest.

The St. Louis Camera Club gave a charming lantern slide exhibition early in the month, on which occasion they had the use of the prize slides of the London (England), Camera Club, and also those of the Syracuse and New York clubs.

One of the recent achievements of photography is that of Professor Levison, who has devised an apparatus by which 10 inches of solar rays may be concentrated into a 1-inch beam, and this, reflected by a glass attached to the forehead of the operator in the performance of operations on the throat, into the larynx; a tiny camera then records the image of the vocal chords.

The California Camera Club gave a very interesting lantern exhibition during the last of March, on which occasion the views were entirely of picturesque English scenery, embracing many of the noted castles and ruins of the old country, and it was much enjoyed by all who were present.

A new feature in an Art Club Exhibition on the other side, which it might be well for some of our own to copy, is the sale of photographs by the artists, of their own works of art, the only stipulation being, that the prints must be the work of the artist himself.

A series of photographic enamels lately shown before the French Photographic Society by M. Raymond attracted much attention and comment. His method of procedure is, by the aid of his photo-colographic process, to obtain proofs in fatty ink which has first been mixed with ceramic colors. Paper is prepared with a coating soluble in water, upon which they are printed and then transferred by means of a varnish, to the surface to be decorated, the paper soaked off, and the object fired. Beautifully rich and vigorous effects are thus obtained, and the process will prove a boon to workers in ceramic photography.

Mr. Robert S. Redfield, the well-known Secretary of the Photographic Society of Philadelphia, took a silver medal for his collection of pictures sent to the Liverpool International Exhibition. At the exhibition there were four thousand two hundred pictures in fifteen hundred frames. The attendance was very large, and the whole affair is pronounced a magnificent success.

We would acknowledge the receipt from Mr. J. C. H. Grabill, of Deadwood, South Dakota, of a large and superb collection of views, which are the most thoroughly representative of Western frontier life of any we have seen. Among them are many of the late Indian outbreak, as well as portraits of a number of the participators therein ; and we also notice several fine views of the celebrated Devil's Tower, noted in a recent issue of the Bulletin. We believe that Mr. Grabill and Mr. Meddaugh are the only two persons who have photographed this remarkable column.

A French journal has lately published an article showing the possibility of photographing bank notes, and has illustrated it so finely as to have laid itself

open to a charge of forgery; and notwithstanding that the author, M. Schlumberger, demonstrates a method whereby it may be rendered impossible to so copy them, it is a matter of grave doubt if he has not put himself in a position where he will be prosecuted. The question has much interest, and we wait its results.

THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES.

BY J. J. ACWORTH, PH.D., F. I. C., ETC.

In an article which appears in Eder's *Jahrbuch* for 1890, upon "Luminescence and the Chemical Action of Light," Professor E. Wiedemann has given us a theory with reference to the vibrations of molecules, their amplitude and the decomposition actions therewith connected, in somewhat the following words:

"The appearance of luminescence is a sign that within a molecule very energetic vibratory movements are present. Such increased vibratory movements must evidently occur in all cases where an absorption of the incident ray takes place, if the absorption depends upon the enlarging of the amplitude of the vibrations in the molecule at the cost of the incident ray, which in these vibrations within the molecule become existing energy; and which may be converted either into radiatory or into heat vibrations. We can conceive both of these occurrences as a kind of damping. By fluorescence the first factor plays a great *rôle*, by absorption without light development, the second.

"If a body is decomposable by incident light a decomposition occurs if, in consequence of absorption, the amplitude of vibration in the molecule has attained a certain magnitude; if however the amplitude remains below a certain greatness no decomposition can practically take place. The value of the amplitude depends, however, upon the absorption co-efficients' greatness, and secondly upon the damping. If the absorption is *nil*, then is the value of the amplitude *nil* and likewise chemical action. If, on the other hand, the damping is very great, then the conversion of motion within the molecule takes place very rapidly, and in spite of strong absorption no decomposition shows itself.

"Now this damping is apparently the greatest for the places of strongest absorption, therefore if we sensitize a plate with some suitable substance for the incident rays which correspond to the maximum, the maximum of sensitiveness may not appear there, but somewhere else more or less adjacent to it."

Such is practically the theory laid down, and in the following pages I shall describe a series of experiments bearing on the relation of spectral sensitiveness to spectral absorption of bromide of silver plates sensitized with various dyes. First of all I will give a short historical sketch of what has been done and said by earlier workers in this direction, but I would remark that hitherto the absorption of the silver bromide plate itself, which was sensitized for the different spectral districts, was not investigated, but either that of the colored gelatine plate without silver bromide addition, or that of solutions of dye-stuffs.

Dr. Vogel has shown that sensitiveness occurs in those parts of the spectrum where there is absorption, a fact which is naturally right, but he went further and affirmed that sensitiveness and absorption maxima agree.

Captain Abney maintains that sensitiveness and absorption agree throughout in their spectral position.

Mr. C. H. Bothamley, in a lecture given before the Society of Chemical Industry, January 30, 1887, states: "When the absorption spectra (of gelatine films stained with dyes) thus observed are compared with the sensitizing action of the particular dyes, it is found that in every case the absorption band and the band of sensitizing effect do not coincide; the point of sensitizing effect is nearer the red end of the spectrum than the point of maximum absorption. This is due to the association of the dye with the dense particles of silver bromide, the band being displaced toward the less refrangible end in accordance with Kundt's law. * * * When, however, the absorption spectrum of the gelatino bromide itself is examined, it is found that the absorption band and the sensitizing effect are absolutely coincident, a result which affords confirmation of the fact first proved by Draper, and firmly established by Vogel and others, that in order that light rays may produce any effect on a substance they must be absorbed by that substance."

Some experiments of I. B. Messerschmidt, who estimated the absorption coefficient of a series of dye-stuffs which were dissolved in a variety of media, arrived at the conclusion that the absorption bands of the dye-stuffs have no fixed position in the spectrum, but that this is influenced considerably by the surrounding medium. With the increase of the density of the solvent the displacement of the absorption bands toward the red also increases. The positions of absorption and sensitiveness maxima estimated by him do not agree. He believed, however, that we can imagine a solution medium or solvent so dense that the displacement of the absorption bands becomes so great that they will agree with the position of sensitizing action. He believed that this would be the case with the dense silver bromide.

Dr. Eder in his new work, "Photographie mit Bromsilber Gelatine," says pretty much the same thing concerning the displacement of sensitizing action with reference to the absorption of the dye-stuff itself. "Therefore, it is proved that the maximum of sensitiveness of dyed gelatino-bromide plates is not identical with the maximum of absorption of the dyed gelatine, but that we must take into consideration the dyeing of the bromide of silver itself. That the silver bromide is, as a matter of fact, dyed, I have experimentally showed. For the explanation of the great displacement of the maximum of light absorption with reference to that of the photographic sensitizing of silver bromide can Kundt's law be quoted, according to which, in most cases, with the increase of the refracting power of the medium, the absorption bands of the included dye-stuffs are displaced toward the red end."

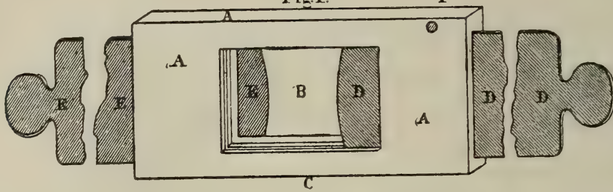
Apparatus and Methods Employed.

For the examination of spectral absorption and sensitiveness I used a spectroscope which was constructed for me after the model of the Kirchoff-Bunsen spectroscope. The prism was of flint glass, the refracting surface being 60 mm. square; the collimator and telescope lenses were 41 mm. in diameter, with a focus of 32.5 c.m. The telescope, collimator and a millimeter scale were each independently capable of being turned upon vertical axes, the whole apparatus being constructed in the most solid manner possible.

Plate-holder.—Near the eye-piece is a frame with side opening constructed in the telescope tube, in which a plate-holder of the following construction could be inserted: It consists (Fig. 1 perspective view, Fig. 2 section) of a brass frame

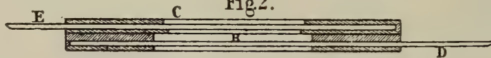
A A A. *B* is a rectangular opening in the frame, 27 x 39 mm. *C* is a narrow ledge upon which the light-sensitive plate rests. *D* is a shutter which slides in and out along the back wall of the frame. *E* is another shutter at the front side of the plate-holder, which likewise runs in a metallic groove. If both

Fig. 1.



shutters are inserted the frame is light-tight. In order to keep the plate as firmly as possible in position, there is placed at the back part of the plate and the shutter *D* a spring made out of watch-spring and suitably bent (see Fig. 4). In order to bring the frame always at the same position in the apparatus, it is provided with a small hole, *F*. To this corresponds a similar small hole in the above-mentioned frame of the spectral apparatus, near the eye-piece, and through both holes a metal pin is inserted.

Fig. 2.



When an absorption had to be made a specially sensitized plate was inserted in the plate-holder. Before the slit a plate was placed, the absorption of which was to be determined, in fact either that of the dyed gelatine film or silver bromide plate sensitized with some dye-stuff. This plate, which was usually about 27 mm. wide and of different lengths, was inserted in a frame (Fig. 3) of the following construction: *A* is the base of a thick wooden block, *B B B* show the top and sides of a channel through which the absorbing plate was pushed.

Fig. 3.

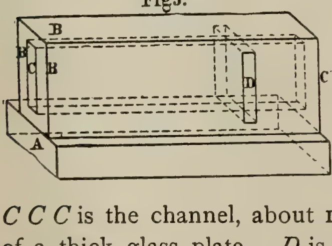
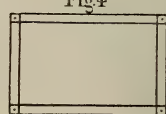


Fig. 4.



C C C is the channel, about 1.5 mm. wide, somewhat wider than the thickness of a thick glass plate. *D* is an opening about 3 mm. wide and 20 mm. high. Through this opening the light falls on the absorbing plate, and passes through it before arriving at the slit. In my apparatus *C* to *D* is about 30 c.m. During an experiment the plate was pushed by the hand, between short intervals, so that a fresh portion was constantly brought before the slit. If a plate happened to be quickly discolored by light it was in that case more frequently moved.

For estimating sensitiveness maxima, the plates were cut up to size exactly the dimension of the plate-holder. The millimeter scale was always photographed, whether for photographs of absorptions or sensitiveness maxima, and generally both exposures were made at the same time. In order to have the upper part of the plate free for the photograph of the scale, the under half of

the slit was covered. Of course in every case a trial exposure was necessary to determine the correct exposure to give.

The Light Source.—In order to work always as nearly as possible under the same conditions, I have in the following experiments, with one or two exceptions, used only one kind of light source, namely a Welsbach incandescent gas-burner. In some cases I gave exposures of seconds only; in other cases I had to give exposures varying from five to ten or twenty hours or more, according to the sensitiveness of the plate employed. The millimeter scale was always illuminated by an ordinary fish-tail gas-burner.

The estimation of the wave lengths with reference to the millimeter scale.—In order to estimate the wave lengths which correspond to the different parts of the millimeter scale, and which throughout always remained the same, I naturally photographed the solar spectrum and scale upon the same plate; and from the Fraunhofer lines and agreeing scale numbers I made a curve in the usual way to determine the wave lengths of the intervals between. The following table gives some of the scale parts with the corresponding wave lengths:

32 *A*	7604	50 *D*	5892	70	4915	90	4360
35	7200	55	5575	72 *F*	4860	92.5 *G*	4307
38 *B*	6867	60	5315	75	4770	95	4250
40	6625	61.5 *E*	5267	80	4620	100	4200
41 *C*	6582	65	5100	85	4485	111 *H*	3960
45	6225						

(*To be continued.*)

[*From Deutsche Photographen Zeitung.*]

THE INTENSIFICATION OF GELATINE DRY PLATES.

BY G. MERCATOR.

The problem of the production of highly sensitive collodion dry plates occupies again, at present, the attention of a number of prominent photo-chemists.* The new article is expected to combine the advantages of the gelatine process and the fineness of the wet collodion process. Whether this can be accomplished or not, the future will teach us; theoretically, the defects which adhere to the dry plates of the present day might—must perhaps—fall to the lot of the collodion dry plates of the future. We always praise the glass clear deepest shadows of the wet plate, the fine modulated half-tones and intense high-light properties, which cannot always be obtained on gelatine plates. It has now been asserted, seemingly somewhat hastily, that, if highly sensitive collodion plates could be produced, these had to show also the brilliancy of the wet plate, maintaining the totally erroneous idea that the picture carrier was the cause of the brilliancy of the picture. But the collodion of the wet plate is just as innocent about the fine drawing of the negative as the gelatine is the cause of the peculiar character of the dry plate. The difference is simply obtained by the manner of picture production. In the wet process the picture, in most cases, is

* Experiments for the production of highly sensitive collodion dry plates were already made three to four years ago, but without any particular success. Recently, a well known Berlin photo-chemist is said to have succeeded in obtaining very good results.

produced by short development and subsequent intensification; in the dry gelatine process, on the contrary, by development only.

These two kinds of picture production differ widely from each other.

If we take an exposed wet collodion plate and pour the developer over the same, the exposed iodo-bromide of silver is reduced more or less according to the strength of the light impression. The reduction takes place, but not in the manner as generally supposed, that the iodide of silver particles would be blackened more or less; but the thin sensitive film should be looked at as consisting of several layers, every one of which is qualified for exposure and development. In the lights now, which have experienced a strong light action, the whole film is reduced, in the half-tones only partially. The light action in the deepest shadows is so moderate, that a reduction cannot be produced by the short development.

If the time of exposure was approximately correct, we must obtain a more or less soft negative (according to illumination). But this is, in most cases, too weak for contact-printing; we continue therefore in the development, and obtain a foggy negative.

Why? The highest lights could not increase in intensity any more, the whole film being already reduced, but the half-tones become stronger, and the deepest shadows were affected by longer development; the total impression was therefore monotonous and foggy; but if the negative had been intensified it would have turned out with brilliancy. In this case the intensifying silver would have precipitated by physical attraction upon the reduced silver of the negative, and more in proportion to the quantity of the reduced silver. The negative was therefore strongly intensified in the highest lights, less in the half-tones and not at all in the deepest shadows, because they had no reduced silver. The original soft and modulated character remained also, while the covering strength and density was increased.

The case is entirely different in the emulsion process, no matter whether it is gelatine or collodion emulsion. Here a very good, soft picture is generally produced during the first stages of development, but which has no printing capacity the same as the wet collodion picture; it must be intensified therefore.

The strengthening takes place here (in most cases), not by intensifying but by continued development. The gelatine film is considerably thicker than the sensitive collodion coating; it contains, therefore, a great number of film layers qualified for development. If correctly exposed, the light impression, necessary for the picture production, passes through the whole film; we can therefore develop the picture to any desired (limited) density. After we have sufficiently exposed to produce a soft picture, the following case takes place: The picture, as it appeared in the beginning, continues to develop proportionally, whereby it increases in density, of course; at continued development, a reduction also takes place in the deepest shadows, which however is proportional to the lights. If the development is interrupted, therefore, before the deep shadows commence to fog, a good result will be generally obtained. If the exposure was too long, the reduction in the deepest shadows will take place before the negative has obtained the necessary density, half-tones and lights will be equally strengthened and the picture monotonous.

This uniform intensification needs an explanation. If we accept a number of light-units to obtain a good negative, they would approximately be divided

as follows: high-lights, 5; lights, 4; whites, 3; half-shadows, 2; shadow-details, 1; of value of light action. If 5 is now the maximum of the light action, the following case will take place in an exposure, which produces in the strongest parts a light action of 6 units, and as the maximum of 5 units cannot be surpassed, a reduction of 1 will take place instead of an increase of 1. 5 will, therefore, become 4. But 4 and all other units can now endure an increase (by continuation of development); the high-lights become therefore thinner, the others more powerful.

The shadow-details will become stronger, the half-tones about as strong as in the normal negative the white parts, but these, with the lights over-strong, the negative "dense."

In the reversed case, at short exposure, one should develop long to obtain the details sufficiently strong, but as the value of light action, if the lights and whites penetrate through the whole film, these will become too strong and will harden the negative.

At all events, it is therefore better not to develop a negative fully (except if the exposure was correct) after it appears sufficiently in all its details, but to intensify moderately. If the plates had too short an exposure, a sensitizer should be applied. If the exposure was too long, old developer or a little bromide of potassium.

The oftentimes ventilated question, if the generally used mercury intensifier answers all requirements, would have to be answered with "yes," according to my opinion. An intensification with nitrate of silver and pyrogallic acid, analogous to the wet process, was proposed at one time. We do not remember who recommended it.

This method, however, is badly applicable. Most of the fixed and washed negatives contain still traces of hyposulphite of soda, but the nitrate of silver is an excellent re-agent for this, and, as a consequence, the negative will easily color light yellow and brown.

To intensify unfixed gelatine negatives is a very difficult matter.

The much complained-of yellow color of the negatives, when intensifying with mercury, is also not a necessary evil.

J. Riesenkönig, Jr., gives a simple prescription, whereby this disagreeable yellowing can easily and surely be avoided According to his information, a strong solution of the mercury is taken and poured upon the negative in such a way as is done in the wet process; the plate is moved gently to and fro and then washed thoroughly with water. The blackening is done in the ordinary way. A negative treated in such a way is always without fault, clear and brilliant.

The mercury penetrates, apparently, into the film, if it has been long enough in contact with the gelatine, and is colored yellow by remaining hyposulphite of soda in the film. This, our view, is confirmed by a notice of Felix Wolfe's in "Liesegang's Almanac," 1891. He dries the negatives before intensifying, soaks them for a short time in water and flows them with the mercury. But solutions of salts, etc., will not penetrate a coating which was dried and soaked again so easily as when the film has become swelled and porous. In all cases it might therefore be recommended to pour the mercury upon the plate (not bathing), and after short action to wash thoroughly, and to repeat this operation several times if necessary. Surprisingly brilliant results will be the consequence.

[*From Advanced Proofs of the Journal of the Photographic Society of India.**]

ELECTRO-CHEMICAL REVERSALS WITH THIO-CARBAMIDES.

By Colonel J. Waterhouse, B. S. C., *Assistant Surveyor-General of India.*

In the course of my experiments on photographic reversals with thio-carbamides, it struck me the complete reversal by transfer of deposit from the exposed to the unexposed parts of the photographic image must be more or less connected with, if not caused by, some electro-chemical action, and that if this was the case, it might be possible to obtain similar reversals by means of an electric current passed through the developer.

Becquerel showed several years ago that if two silver plates coated under similar conditions with a haloid silver salt and arranged so as to form part of an electrical circuit, are immersed in a suitable conducting fluid, the action of light falling upon one of the plates only and not on the other is accompanied by distinct electrical action. Professor Minchin has quite recently found that the same rule applies to silver plates coated with emulsions in gelatine or collodion of haloid silver salts and immersed in very weak solutions of alkaline chlorides, iodides or bromides. It may, therefore, be taken for granted that the action of light upon an ordinary gelatine-silver-bromide dry plate is accompanied by more or less electrical action, and it did not seem necessary for the present purpose to repeat these observations.

The next thing to ascertain was whether during the process of development there was any similar electrical action between an exposed and unexposed silver-bromide film sufficiently strong to be detected with a galvanometer. Several attempts were made in various ways with this object, but unsuccessfully, partly owing to the want of a sufficiently sensitive galvanometer. It only remained to try the effect of passing an electric current from a galvanic cell through developers made up with and without thio-carbamides, and the apparatus was being got ready to do so when the *Photographic News* and other journals, received by the mail of the 23d January, brought out the accounts of Professor Minchin's very interesting and important experiments in photo-electricity. From these I found that he had to some extent anticipated me by his discovery of the fact that if silver plates coated with a silver-bromide emulsion are attached to the poles of a battery, and half immersed in a weak solution of potassium bromide, the film attached to the carbon pole was visibly blackened on its immersed part, while no visible effect was produced on the other, but on developing this plate with pyrogallic acid and ammonia its immersed part also became dark, exactly as if it had been exposed to light for a few seconds.

From this result it seemed probable that my own proposed experiment would succeed. It had been intended to use platinum plates for the electrodes, as recommended by Becquerel in carrying out the photo-electrical observations above referred to, but as pure silver plates were available to hand, and Professor Minchin's observations showed that they would answer as well, at any rate for the purpose proposed, they were used instead, but the experiments should be repeated with platinum plates also. The silver plates used were about 1½ inches wide and 4 inches long, and fixed by means of a block of varnished wood at a distance of about two-fifths of an inch apart. They were marked in asphalt varnish with C and Z respectively, so that in those parts the electrical connection between the silver plate and the silver-bromide film was cut off.

The developer generally used has been the same as for the photographic reversals, viz., eikonogen-soda (Nicol's formula) or eikonogen-lithia, both with sodium sulphite, as given in previous papers on these reversals; also ferrous oxalate, slightly acid and with a little bromide added. The developers were contained in small vertical glass cells. The battery used was a small bichromate-cell (bottle). A tangent galvanometer (Government telegraph pattern and far

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* Through the kindness of the author.

more delicate than the one first used), for the loan of which I am indebted to Mr. E. Dowson, the Government Electrician, was included in the circuit.

I have tried gelatine-silver-bromide films and Eastman's bromide paper in contact with the silver plates, and with all of them have obtained reversed deposition when using an eikonogen developer containing thio-sinamine, but the most decided result, and one which is also quite in accord with Professor Minchin's observations, was obtained with silver plates treated with bromine water.

A pair of such plates marked C and Z and attached to the carbon and zinc poles of the battery respectively, were immersed in a plain eikonogen-soda developer. A second pair of plates, marked $\frac{\text{C}}{\text{TS}}$ and $\frac{\text{Z}}{\text{TS}}$, were immersed in some of the same developer, to which about five drops of a saturated solution of thio-sinamine and of potassium bromide at 10 per cent. had been added, or about the same proportions as used for the photographic reversals. The film sides of the plates were placed inwards, face to face.

After immersion, in connection with the battery, the plates were washed and fixed as usual. The immersions and passage of the current were in all cases carried on in the dark room, and thus the results are in no way photographic.

The C plate shows fairly clear of deposit, but is slightly blackened, especially where the plate has been slightly dirty, the top immersion edge is darker, as with reduced silver. The immersed part of the back of the plate is darker than the front, and also has a black edge at the top.

The Z plate shows a very strong, dark deposit all over, with a clear line at the top. The varnished Z does not seem quite free from deposit. The back of the plate was also quite dark with deposit. This strong deposit on the face of the Z plate accords with Professor Minchin's observation, that the film in contact with his similar plate attached to the zinc pole was developable, though it had no visible action upon it, being only immersed in potassium bromide solution.

Of the other two plates, $\frac{\text{C}}{\text{TS}}$ shows a strongish black deposit with a denser black line at the top and then a clean band above. The back of the immersed part is very black, with a light line above.

$\frac{\text{Z}}{\text{TS}}$ is almost quite clear on the face and free from deposit, showing only a slight discoloration or tarnish, with no deposit on the varnished Z. A clear band at the top of the immersed surface. The back of the plate more strongly tarnished than the front, with a slight powderly deposit.

It will be seen that the results in the two cases are quite different, and may be represented by *c* and Z in the case of the plain developer, and by $\frac{\text{C}}{\text{TS}}$ and $\frac{Z}{TS}$ in the case of the developer with thio-sinamine; the capital letters representing deposit, and the lower case ones freedom from it.

Similar results were obtained with bromide paper and gelatine dry plate bromide films, but it may be remarked, that whereas the C plates show with both developers a clear image of the varnished C, surrounded with more or less dense deposit (much denser and yellower with the thio-sinamine). The Z plates show a difference; those coated with gelatine films immersed in the plain developer showing a dense deposit with a clear Z, while with the thio-sanamine developer, the Z is shown dark on a clear ground. With bromide paper the effect of the plain developer on the Z plate was not so marked as with gelatine films, but these observations require repetition, the films being tender and easily washing away.

Ferrous oxalate developer does not seem to give such marked reversals, at any rate, with bromide paper, as eikonogen does, and this agrees with the photographic results. With the gelatine films, it was noticed that in the plain ferrous oxalate developer the Z plate darkened first, and with the thio-carbamide the C plates blackened first, and most strongly.

The developers do not appear to increase the resistance of the current very much.

It may be noted that pencil marks made at the back of the papers were found to be reproduced very strongly on the film side in contact with the silver plates, especially on those treated with the thio-sinamine developer.

Having obtained these results with bromised silver plates, a further trial was made with similar plates to see if a current could be detected between an unexposed and an exposed plate in the developers alone, without the aid of the battery; and this time with a more successful result. The plates were, as before, treated with bromine water, washed and dried. The developer used was made up of one part each of eikonogen and lithium carbonate with two parts of sodium sulphite in one hundred parts of water. One plate having been exposed to a weak yellow light, the plates were attached to the poles of the galvanometer, and the unexposed plate immersed in the developer. On dipping the exposed plate the needle at once deflected some ten degrees, but quickly returned to zero. With another pair of plates immersed in some of the same developer to which five drops each per ounce of thio-sinamine solution and of potassium bromide at ten per cent. had been added, a similar deflection was observed, but the needle remained for some time at five degrees, and only slowly returned to zero.

It may be noted that, after fixing, the exposed plate of this last experiment showed a black deposit with a dark line at the immersion edge. It showed little or no tarnish, and in most respects corresponded with the $\frac{\text{C}}{\text{T S}}$ plates of the experiments with the battery.

The unexposed plate, on the other hand, showed a very considerable yellow tarnish, stronger on the back of the plate than on its face, and no marked line at the top immersion edge. Generally, it corresponded with the $\frac{\text{Z}}{\text{T S}}$ plates of the battery experiments with the thio-sinamine developer.

The two plates used with the plain developer show very little difference. There is deposit on both, but the exposed plate shows a light line on the immersion edge and the unexposed one shows a black line.

On repeating the experiment, but with the plates attached to the wooden block, so that they were immersed together, it was found that with the plain developer no distinct current was produced on immersing the plates, or afterward, though there seemed to be very faint indications of a current, which might be visible with a more delicate galvanometer. With the thio-sinamine developer, however, although there was no immediate deflection, the needle slowly turned in the same direction as before to about five degrees, remaining there for some time, and then again slowly returning to zero. This action seems to correspond with the gradual change of the photographic image under the thio-carbamide developers.

On repeating this experiment with a fresh pair of plates, in fresh developer containing only 1 per cent. of sodium sulphite and about 5 drops to the ounce of an alcoholic solution of Professor Reynolds's compound salt of thio-carbamide and ammonium bromide, exactly the same result was obtained.

The strong initial deflection of the needle when the plates were immersed separately appears to be due to polarity, and was noticed by Becquerel. On immersing two unexposed plates separately in the same way in plain developer a similar deflection was observed, but very much stronger.

These results cannot be taken as conclusive, and a great deal of further investigation is necessary with other developers and thio-carbamides, as well as with other silver haloid films used with and without the silver plate conductors. The products formed at both poles by the electrolytic decomposition have also to be examined.

As far as the experiments go, however, they seem to show :

(1.) That the same kind of reversal of the deposit on silver bromide films can

be effected by a developer containing thio-sinamine, both electrically and photographically.

(2.) That the reversal of the photographic image on such films by thio-carbamides is to a great extent if not entirely, due to electro-chemical action.

(3.) That the development of the photographic image on silver bromide films is accompanied by electro-chemical action.

Taken in connection with Professor Minchin's recent observations and the earlier ones by Becquerel and others, they appear to point to the conclusion that photographic action, at any rate, as regards the haloid salts of silver, is influenced by electricity, both in the action of light upon the silver haloid film as well as in the development of the invisible image so produced, to a very much larger extent than has usually been recognized. This aspect of the theory of photography appears to have been somewhat neglected, but it seems likely that further investigation in this direction would be rewarded with valuable results, and throw some new light on the mystery which still surrounds the formation and development of the invisible photographic image.

P. S.—Further observations made with silver plates coated with a film of precipitated silver bromide in pairs of one exposed and one unexposed plate, connected with a very delicate suspension galvanometer, showed not only a distinct electric current between the plates immersed in the plain eikonogen-lithia developer, but a reversal of the current with plates immersed in some of the same developer to which 5 drops per ounce of the compound salt of thio-carbamide and ammonium bromide had been added. With the ordinary developer the exposed plate forms the negative pole of the circuit, whereas with the thio-carbamide developer it forms the positive pole. The same rule has been found to hold good wlth thio-sinamine. With the thio-carbamide developers the current is more powerful than with the plain developers. Further experiment is, however, neceessary with other plates to confirm this reversal of the current, which seems highly probable and was to have been expected.

[*From the Journal of the Franklin Institute.*]

PHOTOGRAPHY IN THE COLORS OF NATURE.

BY F. E. IVES.

[A lecture delivered before the Franklin Institute.]

(*Continued.*)

In 188–, Dr. F. Stolze, of Berlin, made a series of investigations, and tried to solve the problem by devising a procedure more in accordance with Young's theory of color.* He said: " Although the colors correspond with certain external processes in nature, there is also no doubt that color as such is nothing objective, but a subjective sensation, based upon the peculiar irritation of the visual nerves by those external proceedings. We can, therefore, only hope to produce a picture in natural colors when we are enabled to reproduce upon the same the proceedings which furnish to us the color impression." " The general idea of all colors being based upon the three principal colors, red, yellow and blue, is an erroneous one." " Theodore Young * * * assumes that there are three kinds of nerve fibers sensible to red, green and violet. Objective homogeneous light excites all three; but with red the first is excited strongly, the second and third weakly; with blue, the second and third moderately strong, the first weakly; with violet finally, the third strongly and the first and second weakly. If all three kinds of nerve fibers are equally strongly excited, the impression of white light will take place."

This theory, in accordance with which Dr. Stolze tried to devise a theoretical solution of the problem, is only partly correct, measurements by Clerk Maxwell and others having shown that the " red " sensation is neither affected by blue-green, blue or violet rays, nor the " blue " (violet) sensation by red, orange or yellow rays, nor the

* Anthony's Photographic Bulletin, 1888, pp. 516, 555, 588, 647, 678.

"green" sensation by red or violet rays. Neither is it the red rays that chiefly excite the red sensation, nor the violet rays that chiefly excite the blue (violet) sensation.

As a result of elaborate calculations, which, it must be said, could just as well have been made without any reference to Young's theory of color, Dr. Stolze came to the conclusion that if three suitable selective color screens were used in connection with color-sensitive plates, three negatives of the spectrum might be obtained, from which prints in cyan blue, carmine and yellow, if superposed, would reproduce the color effect of the spectrum. He did not show how to make selective color screens calculated to secure the right kind of negatives to carry out this idea, nor state what should be the form of the intensity curves in such negatives of the spectrum. He merely gave a table, showing on what parts of the spectrum each negative should fix color, and said: "If successful * * * in selecting the color screens in such a manner that they will let the colors pass through which are called for in this table, one will indeed be able to reproduce a pure spectrum in this way." By further calculations, he was able to show that this plan, even if successfully carried out, would not insure the correct reproduction of mixed colors. He said: "All pure saturated spectrum colors will also be obtained quite satisfactorily in the reproduction, but the mixed ones only partly." "Oftentimes they have to become more or less impure." "But the clearest lights and a number of mixed colors appear very unsatisfactory." He added: "The intelligent support of the artist can lend improvement," and recommended also the production of a fourth (ordinary) negative, to be used in combination with the others, to modify the effect, especially in the high-lights.

This plan cannot be said to definitely represent the application of Young's theory of color, but it may be practically better than anything that that theory would indicate, if we leave out of account the suggestion of a fourth negative.

In 1885, Dr. Vogel published a plan which is a modification of Poirée's.* Like Poirée, he proposed to make a separate negative for each spectrum region; but instead of using plates sensitive to all colors and exposing through selective color screens, or illuminating the subject by monochromatic lights, Vogel proposed to sensitize plates specially for each spectrum region, which would amount to the same thing; and instead of projecting the pictures with colored lights, he proposed to make as many pigment prints as negatives, each in a color complementary to the light which acted to produce the respective negative, and to superpose them as in the Collen method.

There are no known dyes with which this plan could be carried out, and even if there were, it is, I believe, too complicated to be practicable.

In February, 1888,† I demonstrated a procedure based upon the assumption that, although there are more than three or five or seven primary spectrum colors, all of them—and in fact all the colors of nature—can be counterfeited to the eye by three type colors and mixtures thereof. This was not a new observation, and my plan did not differ very materially from that of Dr. Stolze, minus the complication of a fourth negative, except that it was more definite; and instead of merely publishing it as a suggestion, I found means to carry it out, and made a practical demonstration of it. I proved the process by photographing the spectrum itself, employing compound color screens carefully adjusted to secure definite intensity curves in the spectrum negatives, so that they would make color prints which counterfeited the color effect of the spectrum when superposed. The adjustment of plates and screens to secure spectrum negatives having definite intensity curves, which, I believe, had never before been done, made all the difference between an indefinite and uncertain method and one definite and precise.

Promising results were obtained by this process, but I soon came to the conclusion, already reached by Dr. Stolze, that a process might reproduce the color effect of the spectrum, and yet not be capable of reproducing perfectly the compound

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* *Annalen der Physik* (*N. S.*,) xxvii, p. 130; *Photo News*, 1887, p. 568.

† *Journal of the Franklin Institute*, 125, 345.

colors. The solution of the problem was incomplete until I discovered a new principle, according to which such a procedure can be made to reproduce not only the spectrum, but also all the hues of nature.

This new principle, first stated by me in a communication to this Institute on November 21, 1888,* is that of making sets of negatives by the action of light rays in proportion as they excite primary color sensations, and images or prints from such negatives with colors that represent primary color sensations.

In order to understand this principle, I must explain that although the spectrum is not made up of three kinds of color rays and mixtures thereof, the eye is only capable of three primary color sensations—a distinction of the utmost importance, for the reason that the spectrum rays, which most powerfully excite a primary color sensation, are not the ones which represent the character of that sensation. The primary sensations are red, green and blue (violet); but it is not the red, green and violet spectrum rays that most powerfully excite these sensations. According to Clerk Maxwell, the orange spectrum rays excite the red sensation more strongly than the brightest red rays, but also excite the green sensation; the greenish-yellow rays excite the green sensation more strongly that the purest green rays, but also excite the red sensation; the yellow rays excite the red sensation as intensely as the brightest red rays and the green sensation as intensely as the purest green rays. Maxwell's diagram is a graphic representation of the result of careful photometric measurements of the effect of the spectrum upon these primary sensations.

1, 2, 3 are spectrum colors, which represent primary color sensations, because each excites one primary color sensation exclusively, and *a*, *b*, *c* are curves, showing the relative power of spectrum rays to excite the respective primary sensations.† These conclusions are stated and endorsed in all recent text-books on color, and that eminent physicist, Lord Rayleigh, goes so far as to say that the theory is as well proved as the law of gravitation.

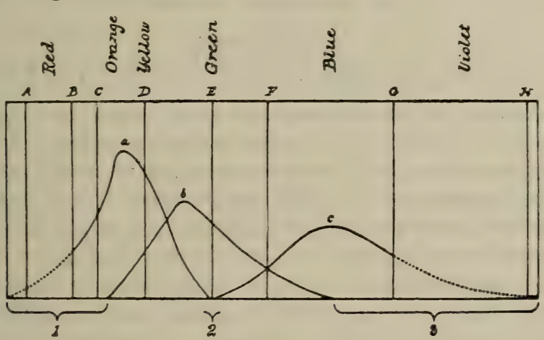


Fig 1

I emphasize this, because another theory of color has recently been proposed, which, although it has been circulated in the newspapers as if it had high scientific endorsement, is really inconsistent with established facts, and cannot, therefore, be true.

The carrying out of my new principle, according to Maxwell's measurements, therefore, involves the production of one negative by the joint action of the red, orange, yellow and yellow-green rays, in definite proportions, to represent the red sensation; one by the joint action of the orange, yellow, green and green-blue rays, in definite proportions, to represent the green sensation; and one by the joint action of the blue-green, blue and violet rays, in definite proportions, to represent the blue sensation.

* *Journal of the Franklin Institute*, January, 1889.

† Taken separately, each of these curves is probably correct; but the three do not compound to represent accurately the relative visual intensity of different parts of the spectrum, because the curve of the green sensation is relatively too low, and that of the blue sensation too high; if the curve of the green sensation be drawn as high as that of the red, and the height of the blue curve be reduced one-half, they will compound to represent fairly a photometric measurement of the visual intensity of the spectrum.

Negatives of the required character can be made by exposing a cyanine-stained gelatine-bromide plate through a double screen of chrysoidine-orange and aniline-yellow of suitable intensity for the red sensation, a cyanine-erythrosine gelatine-bromide plate through a screen of aniline yellow of suitable intensity for the green sensation, and an ordinary gelatine-bromide plate through a double screen of cryso-phenine-yellow and RR methyl-violet for the blue sensation. The plates and screens are correct when they will secure negatives of the spectrum showing intensity curves substantially like the curves in Maxwell's diagram. The negatives can also be made on certain makes of ordinary commercial gelatine-bromide plates of the most rapid kind, by the use of quite different color screens for the first two, but only with exposures of from five to fifteen minutes on well-lighted landscapes, aperture of objective *f*-12.*

In photographing objects in a changing light—landscapes, for instance—it is important that the three sensitive plates be exposed simultaneously; and in order to accomplish this, I devised a triple camera, having three lenses so arranged in connection with reflectors as to bring all the points of view within a 1-inch circle. With this camera, the production of sets of negatives of the required character is a simple and easy matter, it being only necessary to insert the plates, raise the flap until the exposure is made, take the plates out again, and, when convenient, to develop them together in the ordinary way.

There are two ways of making the heliochromic pictures from these negatives. The first method does not produce a permanent picture, but a screen projection.

(*To be continued.*)

[*From The British Journal of Photography.*]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

(*Continued.*)

Chapter IX.—The Lower Portion of the Face.

Having bestowed all the necessary care upon the treatment of the forehead, eyes, nose and upper lip, we come to a very important feature indeed. It is not always that it requires much at the hands of the retoucher, but when it does, it demands his utmost skill to successfully treat it. This very important feature is the mouth. How much the success of a picture is dependent upon the successful treatment of the mouth will appear evident to all students who have more or less closely examined the portraits painted by our most famous artists. It is a feature that may be said to give tone to the entire expression of the face. What portrait can possibly be accounted a success if the mouth be not successfully represented? The answer is easily found: None! To the operator who aspires to the production of really good and artistic work, it is always a point upon which he bestows his very best attention. He arranges the light, turns the head, and tries numerous other ways to get this feature in such a position as will show it to the greatest advantage. If, then, this feature demands so much attention at the operator's hands, so must it also when it comes to the retoucher.

Many times the operator is not able to photograph the mouth in the exact position he would wish, owing in many cases to the fact of the nose not suiting favorably to the same view of the face. In such a case the operator often decides to compromise the matter and go between, not wishing to sacrifice one feature for the other, and trusting to the co-operation of the retoucher to aid him in securing a pleasing and successful picture. In most cases where the operators and the retouchers work well

* I claimed that the production of such a set of negatives as I have described represented the application of a new principle in composite heliochromy. Some photographic *litterateurs* were disposed to sneer at such a claim; but after leaving the matter open for discussion for nearly two years, I applied for a United States patent, and, in view of all the evidence, was granted exclusive right to make such sets of negatives.

together, and take a mutual interest in the works they turn out, many successful portraits will be produced of people who will willingly confess that they have successful pictures for the first time in their lives. It is an easy matter to please them; it only wants a little thought and friendliness between the two departments—operating and retouching—to produce the desired result.

In retouching mouths it must be constantly borne in mind that their form and expression are quite as susceptible of change under the various conditions and influences of time—ill health, hardship, study, etc.—as any of the other features which at different periods of life alter their formation and expression. As the mouth, too, is capable of giving expression to most of the human passions, great care must be taken not to deprive it of any of its individuality when retouching it. It is needless to say that when the expression of a sitter's mouth is hard or unpleasant, or generally giving the idea of unamiability of character, much can and should be done by careful and skillful retouching to render it more pleasing and acceptable. It may be laid down in regard of all changes wrought by retouching that it is very seldom, if ever, that the total obliteration or taking away of any expression, however unpleasant it may be, will succeed in giving complete satisfaction to the party most concerned. Of course, this applies where the said expression is natural, and not accidental.

In the case of children still in the age of infancy, the mouth is a great feature in their pictures. Its round and well-defined form should always be retained, and the natural beauty of its construction must not be tampered with and spoiled by a too lavish employment of high lights. No doubt the latter, judiciously placed, do much to impart a brilliancy and finish to a portrait, but when all is said and done, half-tone and softness are much more preferable to the, in many cases, meaningless white of the exaggerated high lights. In the mouths of infants beauty of formation is more noticeable than expression. Children, while young, invariably smile and laugh with their eyes more than any other feature, and these carry more expression in their emotion than the mouth. This, however, soon changes, for as the child advances in age, and the teeth begin to make their appearance, a distinctly different formation is noticeable, the mouth becoming gradually more and more elongated with the advancing growth of the teeth, and thus coinciding more in expression with the eyes. There is nothing more interesting than the study of these changes, and nothing that will aid more in cultivating our appreciation of the various delicacies of facial anatomy.

As time rolls steadily along, age will be found to produce other and equally remarkable changes; as the teeth begin to disappear the mouth seems to shrivel up and lose its power of varying expression. All this may seem very unimportant to the casual reader, and no doubt is, but to the careful and diligent student, who wishes to become a master in his art, it is not so. It is a matter of vital importance that all these points be kept well in the minds of all retouchers when they essay to beautify or flatter an image on a negative. Every retoucher should endeavor to become familiar with these and such like changes, as a thorough knowledge on these points will enable him without very great difficulty to impart a youthful appearance to a negative, when such is desired, and at the same time not make any such alteration too apparent, or, as is often the case, grotesque, by reason of its ridiculous exaggeration. In this way a portrait may be made to please a sitter—for it will look a little younger, and at the same time possess a more pleasing expression—because the retoucher's work will have been carried out thoughtfully and with due avoidance of exaggeration. A picture treated successfully in this manner will be rendered acceptable as a whole, and yet it would be almost impossible, even taking each picture individually, to point out the difference between the picture and the sitter. All the various indications would be there, but in a judiciously modified form, the real excellence and artistic merit of the picture being in exact ratio to the skill and artistic culture of the retoucher.

A light should be placed, but with great care and judgment, upon the upper edge and nearly in the center of the lower lip. This, if properly done, will add to the form

and expression of the entire mouth. The upper lip seldom, if ever, requires our aid. The lips will often be found to have a number of small upright depressions or seams, which give them a very unpleasant appearance. This is caused by the skin becoming dry or cracked, and might have been avoided, had the operator observed it in time, by his requesting the sitters to moisten their lips in the usual manner. These marks, when found in the negative, must be entirely softened. The shadow to be found under the lower lip generally requires but little work, merely softening so as to lead it into the chin, and thus avoid too much rotundity or projection.

Another portion which should receive our most particular attention is the corner of the mouth. The lighting will have much to do with the strength of this marking, and great care should be bestowed in order to preserve its significance. In some faces the hollows at the ends of the mouth are very deeply marked, while in others they may be absolutely unobservable. I have known many mouths which seemed to break off at the corners, and not leave the least shadow at the corner. This is a very unpleasant form of mouth, and not at all likely to please the possessor when shown it on a portrait. When possible (in such cases) it would be well to try to induce a slight shadow, by brightening the surrounding portions of the face, and thus procure it by contrast. Sometimes, too, when these markings are rather deep, they will, when combined with a plump or fat jaw, throw a fairly long shadow in a downward direction. This peculiar marking carries a vast deal of expression, and therefore must command our attention. Should these shadows fall or drop, describing a portion of a circle, the ends tending inwards, they should be softened, and, if possible, made to take an outward tendency, as a more pleasant expression will be found by their so doing.

In some formations of faces the furrow running downwards from the wing of the nose will seem to join the one from the corner of the mouth. Such a portrait will give excessive trouble to the retoucher before he successfully manages to make it acceptable. The continuity of these lines must at all hazards be broken, but very carefully, or ruin will attend our efforts. We must, in such cases, not only break the continuity of the shadow, but we must try to raise the muscles of the surrounding portion of the face. Generally, with care, all this may be carried out successfully, but if careless lighting should unduly accentuate the furrows on a face naturally deeply marked, owing to the fatness of the cheek, it may be found impracticable to carry out such a treatment.

In cases where the lips come very dark, be it either through defective lighting or under-exposure, something must be done to help the shadows, or else the mouth will look like a black gash, hard and crude. Under these conditions we should leave all the half-tone we can on the surrounding portions of the face, for if we brighten up same it will be impossible to help up the mouth, but with the half-tone well preserved, a few touches will make the mouth itself fairly acceptable.

It is not at all unusual to be called upon to alter the shape of the mouth; to do this demands not only judgment and experience, but a certain knowledge of drawing as well. In such cases the lower lip may appear too full, or even coarse; we will then be expected to reduce it, thereby bringing it within ordinary dimensions, and so considerably flatter the sitter. The upper lip, when requiring treatment, will generally be found to only want the shaping of same made more decided. Sitters will many times want their mouths made smaller, and in such cases great care must be taken, lest, in making the mouth smaller, we should produce a certain hardness of outline. In this regard no pains should be spared if we wish to be successful. I do not think there is much more to say about this feature, so we can leave it and pass to the treatment of the chin.

The chin is a much more characteristic and difficult feature to treat than is generally supposed. Chins vary so much in shape and form that each must be treated in a different and special manner, and really should form a separate study. The general character or power of a head is very considerably influenced by this feature, and it

should be brought forward with due importance. If it should possess an incidental characteristic which would tend to make an unfavorable illusion, the same should be subdued and modified. In the case of a very flat or a greatly elongated chin, too much predominance will prove objectionable; therefore, our efforts should be directed to subdue it. This suggestion will also apply to the dimples in the cheeks of youth. It is not always justifiable to argue that because these markings are strongly indicated in nature they should be similarly represented in a monotone portrait; for however skilled and careful an operator may be, and however much he may have mastered the anomalies of photography—and we will give him credit to the utmost point—still he can never make his portrait a living creature; and until he secures the power of being able to do this, all blemishes and personal defects will be represented more strikingly than they are in nature. I hold it the same, that monochrome work must always compare unfavorably with colored work in the delineation of these peculiarities of nature.

The chin although varying considerably in form, is generally more or less round, and mostly with a slight indentation in the center. If this indentation be strongly marked and tending to a point, it forms what is called a dimple, and however much we may modify it, we should never totally lose it. In the majority of cases, however, it does not merit the appellation of dimple, but is, if I may so describe it, an undulation. The light should never be too strong upon this feature, and in retouching it, therefore, we should be careful not to work it into too much prominence. In some heads the chin will be found to be of a square formation, and if not very carefully lighted this will appear much more remarkable on the negative than in nature. The retoucher in such cases may, with much benefit to the portrait, round off the sharp ends, just in the same manner as he would take a point off a heavy or square jaw, and so relieve the heaviness that would otherwise assert itself. I need not say care should be taken not to carry this kind of work too far, as the line which separates the sublime from the ridiculous in this regard is very fine indeed.

With these remarks I think we have nearly exhausted the different treatments for the various portions of the face proper; and assuming that we have carefully stored them up for future use, we can unhesitatingly turn our attention in other directions.

[*From the British Journal of Photography.*]

COPYING BOOK ILLUSTRATIONS AND OTHER SIMILAR SUBJECTS BY ARTIFICIAL LIGHT.—II.

BY T. N. ARMSTRONG.

In a previous article I described a simple arrangement whereby bound or unbound photographs, cartoons or other similar subjects, might be held *in situ* for the purpose of being photographed. Doubtless there are other methods, such as a copying-board carrying vertical and horizontal lines, which permit of the objects being bound by studs or elastic cords so as to be held in the position that is desired; but after all, where the objects are not very large in size, the simple adoption of an ordinary printing-frame is just as good if not better than any other plan. Whatever method, however, be employed, one essential point which must not be overlooked is the placing of the object being copied exactly parallel to the sensitive plate. When a copying-board is used which has lines drawn across its surface from side to side at equal distances, but little difficulty will be found in registering with ease any objects in an ordinary printing-frame when the same is stood up on end or on its side true to the lines on the copying-board.

Having described a few adjuncts which are necessary for undertaking this work in a comfortable manner, I shall now proceed to write about a simple arrangement which any one can rig up for himself with very little cost and trouble. Where any one has at command a supply of ordinary house gas there is no more simple or

effective way of illuminating the objects than by the use of a couple of good-sized Argand burners. I do not profess to know much about the candle power of this or that particular gas burner, but I am told that the ones I use when burning Glasgow gas give somewhere about sixteen candle power each. With two of such burners, coupled together by means of an ordinary india-rubber tube and a metal T-piece fed from any ordinary gas pipe or jet, a beginner becomes possessed of all that is necessary to so light up his objects as will yield perfect negatives when a fairly liberal exposure be given. Of this, however, I will have something to say later on. The fitting up of the Argand gas burners is quite easily accomplished without the aid of any expensive gas fittings, or even without the necessity of calling in the services of a gas fitter.

The following is how I went about rigging up an arrangement that has given me unbounded satisfaction. The first thing is to get a piece of board about half an inch thick, and cut this into two pieces, each four inches square. These pieces of wood are for the purpose of acting as a pedestal for carrying an upright bar. This upright bar is nailed or secured in the center of the pedestal at one end, and when firmly screwed or nailed on to the bottom or pedestal, bore a hole sufficiently large through the upright bar as will permit of the gas-pipe end of the Argand burner being slipped through. This hole may be conveniently bored about two inches from the bottom. The brass flange of the burner is then screwed on to the upright bar, which done, you have an Argand gas burner that will stand steady and in no way liable to be upset when working. A tin reflector is then added to the back of the burner—mine was made out of an old lime tin. There are many simple ways of attaching a tin reflector so as to throw the light nicely forward. I fastened mine on by means of a tin collar ran round the upright bar; this permits of the catch of the reflector slipping in between the collar and hood of the upright bar. These arrangements concluded, it simply remains that the Argand burners be attached to the india-rubber tubing at each end of the T-piece, when they may be lit up.

It is best not to bore the holes too high up the upright bar, otherwise the flame or light would be too high, for when working on small-sized objects (say such as are conveniently held in a whole-plate printing-frame), the flames will be found to be just about the center of the object when the frame carrying same is stood up on its side or end at the extremity of the copying-board.

In my practice I invariably use a Ross rapid symmetrical lens of about five inches focus, and stop the same down to *f*–11. The most of my work is done with a square whole-plate camera; and when producing negatives for lantern slides to be eventually produced from same, I employ a carrier holding a plate $3\frac{1}{4} \times 3\frac{1}{4}$, from which the resulting transparency is made by contact—very frequently more so, in fact, than in any other way—by means of wet collodion for the lantern slides, and find no trouble in printing same in contact. Later on I hope to refer more in detail to the *modus operandi* of doing such work, but, of course, the simplest way for amateurs is the using of a suitable lantern plate; they cannot, however, at all compare with collodion for the work we are considering.

So much for the necessary apparatus. Now let me proceed to describe how I should go about making a negative with the aid of same, and as I write I call to remembrance a typical case which has just been done by me. In this case a large cartoon, such as we often see handed round with newspapers, was brought to me to make a slide from, and but very little time was allowed for the accomplishment of the work. This cartoon, it must be observed, represented a large group of heads and busts of leading characters in a public entertainment that had just been very popular in Glasgow, and was in a sense rather a good production of its kind, or perhaps I should say somewhat removed above the common order of the penny-dreadful stamp of publication; the likenesses were exceedingly good in a rough kind of way, and, taken altogether, was just a first-rate subject to work upon. So before I proceeded

to make a negative from it I saw at once that much could be done in the way of improving the cartoon by working up the faces with a hard lead pencil. In all similar pictures there are always more or less flaws that are quite easily filled in and shaded off. This done, the eyebrows and dark portions of the cartoon were more or less deepened by a slight application of India ink, and many other little touches given here and there, till the cartoon commenced to assume the appearance of a really creditable production. After as much work in this direction had been done as time permitted, the cartoon was placed in a 15 × 12 printing-frame carrying a sheet of glass, the back inserted and spring up, and placed in position on the end of the copying-board. The whole-plate camera was then adjusted on a wooden stool on the copying-board, so as to bring the lens almost on a line with the center of the picture. The two Argand burners were then lighted up and removed backward and forward till it was seen, when looking from the back of the camera, that the glass of the printing-frame did not show any reflections of the flame over the portion of the picture that would be included in the negative. In this case a large 15 × 12 white mount was placed on the copying board between the picture in the frame and the camera. This acted as a most efficient reflector, and proved to be of very great service in throwing up the light so as to ensure an evenly lit surface; in fact, in the negative not a trace of inequality in illumination could be noticed. So much for the manner of lighting.

When working on large objects, such as 15 × 12 pictures, the lights require to be placed farther apart, and the reflector between the camera and the printing-frame is almost a neccssity, but when only small objects are being copied, of course the lights and camera are all working at closer quarters. The one main thing to observe is that there is no appearance of the flame spots on the glass in the printing-frame, and the lights should be adjusted near enough so as just to clear the same; of course bearing in mind that at all times they are kept outside the field of view of the lens. When working with a lens of the description named, they will seldom intrude; but should workers use wide-angle objectives, some little thought must be given to see they are kept sufficiently apart.

Before, however, that any one proceeds to make a negative from such a subject as I have mentioned, the picture should be carefully scrutinized for defects, and the same removed with a hard lead pencil. Any one could hardly believe till they see it what an amount of improvement can be made on such pictures by a little judicious working up here and there and spotting out defects. It does not need any experience to overcome, and is just one of those nice little occupations paterfamilias can set about with his slippers on of an evening and his little ones looking over his shoulder all the time, if, indeed, the little ones cannot do it for him.

In my next I hope to refer to exposure and development.

[*From The Optical Magic Lantern Journal.*]

PLAIN PHOTOGRAPHS PROJECTED IN COLORS.

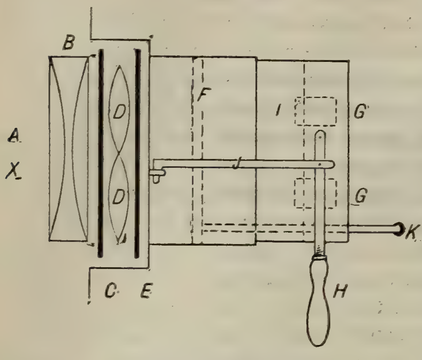
THROUGH the kindness of the inventor, Mr. Albert Scott, of Weston-super-Mare, we have had an opportunity of examining and trying his new lantern, which is termed the Verak. The general arrangement displays great ingenuity, and the results as seen on the screen are very striking.

In order to see transparencies in color, negatives must be taken four on a plate (isochromatic), each lens being provided with a colored screen; these colors are green, blue, red and violet.

To make the exposures of the same duration the lenses are provided with stops of different sizes. Transparencies are made from the negatives, which by preference should be somewhat dense to produce brilliant colors.

The four transparencies contained on the one plate present different local gradations of intensity, according to the colors of the object photographed.

The cut shows the order in which the lenses, slides and colored screens are placed in the lantern : *A*, the light ; *B*, main condenser ; *C*, screen, containing the four colors through which the negative was exposed ; *D*, set of four auxiliary condensers ; *E*, the Verak slide ; *F*, registering lens ; *G*, four projecting lenses ; *H*, lever for focusing ; *I*, sliding tube containing the four lenses ; *J*, fulcrum for focusing lever ; *K*, rod by which *F* is moved.



The transparencies are placed respectively in front of the same colors through which they were photographed, and when they are projected on the screen may at first present the appearance of four pictures in the different colors in a confused state. These are registered by moving the handle *H* sideways, parallel with the screen, which gives a twist to the tube *I*, while they are finely adjusted or centered by pushing in or withdrawing *K*, which actuates the lens *F*. In the case of a photograph of a shop front, the various colors of goods in the window presented a fine appearance, the different colors being well depicted.

Owing to the density of the colored screens through which the light has to penetrate, a strong illuminant must be employed. With a blow-through jet we obtained pictures about 4 feet square, but with a mixed jet of large bore there is no reason why a picture twice the size should not be produced ; but in this case the audience would require to be some distance from the screen, so as to overcome the difficulty of exact registration, for it must be remembered that the pictures being taken from points slightly apart, absolute registration is impossible, but by confining the projected pictures to somewhat small diameter, this defect is lessened, and unless viewed at close quarters it is not noticeable.

In the 4-foot picture spoken of the lantern was placed about 10 feet distant, while the pictures looked best from a distance of several feet beyond this.

We projected about two dozen slides, which Mr. Scott informs us are apprentice work, but after one gets fairly in working order, there is no doubt that very fine results can be obtained.

Arrangements are being made to publicly exhibit the effects produced by the Verak, and those who are privileged to be present will see something of a decidedly novel character.

[*From the Photographic News.*]

THE NEW DISCOVERIES IN HELIOCHROMY.

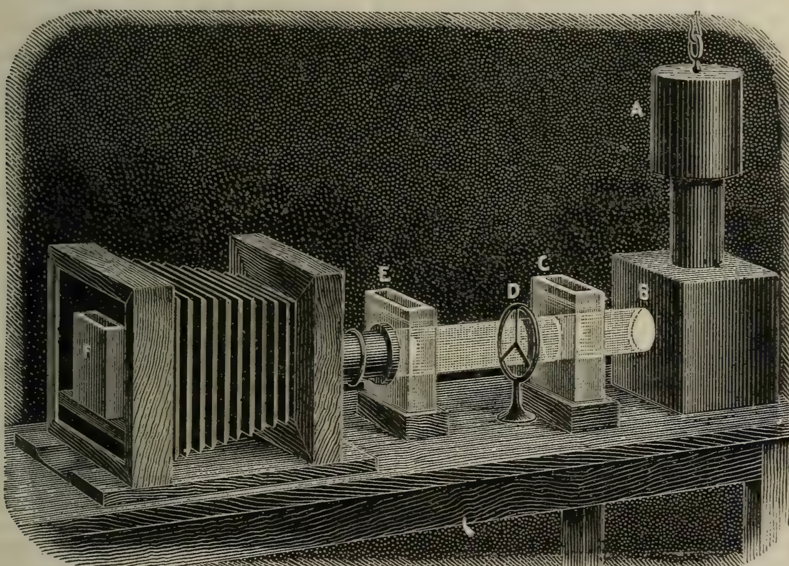
AMONG the chief points in which experienced practical photographers might attempt to help to adapt the recent great discovery of Professor Lippmann to utilitarian purposes are : (1) The production of an absolutely colorless and transparent dry plate highly sensitive to light ; (2) To find a developer for the said dry plate which will give a shining silvery-white image by reflected light, and a pure black or gray one by transmitted light ; (3) The application of suitable orthochromatic methods of rendering the plates more sensitive to red and yellow light.

By the wet-plate process there was no difficulty in getting silvery whites, as in the collodion positive process, in which an iron developer was used in conjunction with a suitable proportion of glacial acetic or nitric acid ; a trace of nitric acid had a strong influence in the yielding of a brilliant white deposit. The wet process is, however, in all probability, not applicable to these heliochromic pictures, because of the film being expanded with liquid at the time of making the exposure ; consequently, any interfer-

ence bands registered by means of the film will not be of the same distance apart when the film shrinks in drying.

The *Photo-Gazette*, of Paris, in its number of February 25th last, gives the accompanying engraving of the apparatus used by Professor Lippmann in photographing what the *Daily News* correspondent called his "stained glass window." This window is represented at *D*, and it consists of three pieces of colored glass, mounted in a circular frame. *A* is a loose cap over the chimney of the electric lamp, to exclude stray light from the room; *B* is a parallel beam of light from the electric lamp; *C* is a vessel of water to cut off some of the heat rays; *E* is a vessel containing elianthine to cut off the blue rays while giving a longer exposure to the red; *F* is the trough carrying the sensitive plate and its mercurial backing.

A communication from Lord Rayleigh, in another column, shows that he long ago published the idea that the colors in Becquerel's photographs were those of thin plates. He speaks of Wiener's experiments; Wiener seems to have been the first to photograph interference bands in thin transparent sensitive films, and he just missed discovering the value of the method in heliochromy. A week before M. Lippmann



announced his discovery at the Academy of Sciences, M. Cornu drew the attention of that august body to a paper by Herr Weiner, contained in *Wiedemann's Annalen*, Vol. XL, page 203, 1890, giving the experimental solution of the problem of determining the direction of vibration in polarized light. "The method consists in letting a wide beam of polarized light fall upon a reflecting surface at an angle of 45 degrees. As the beam is wide, there is a zone where incident and reflected rays cut one another at right-angles; and if interference phenomena are produced in this zone, the direction of vibration of the polarized light must be normal to the plane of polarization and perpendicular to the direction of propagation. In order to find the nodes and ventral segments, M. Wiener has used an extremely thin photographic pellicle, so transparent that it will allow a free passage of the two waves which cross at its surface, and yet sensitive enough to receive impressions. By means of this exploring pellicle, the existence of interference fringes has been made manifest."

Mr. Frederick Varley has been minutely studying the character of the planes of quiescence and disturbance in films, as prepared by M. Lippmann, and has come to the conclusion that they are not absolutely true planes, but are a range of little hills and valleys; the planes are speckled, so to speak.

M. Lippmann's colored photographs have, like Daguerreotypes, to be viewed at a particular angle to the incident light, and the colors are seen best with a black background to the plate.

At the meeting of the Photographic Club of Paris, held on February 18th last, Dr. A. Berget, of the Sorbonne, exhibited some of M. Lippmann's heliochromes, and described their production. The official report in the *Bulletin* of the Club says that repeated bursts of applause testified to the interest the assembly took in the scientific communication of M. Berget. The communication of the latter is printed in the *Bulletin*, so also is an illustrated article on the subject by M. Ch. Gravier, but they contain no additional information to that already published in these pages.

In *Le Moniteur de la Photographie* of February 15th, M. Léon Vidal says of M. Lippmann's photographs: "The impression—or rather the sensation—of the spectral colors is very decided; certain proofs are even brilliant."

Merely as a matter of history, a translation of the statement made by M. Becquerel at the Academy of Sciences, the same evening that Professor Lippmann's discovery was first made known there, is hereunto appended, but we doubt the scientific accuracy of its contents. As stated in these pages last week, Becquerel's preliminary treatment of his films seems but to have made them slightly more continuous and transparent, so that interference phenomena could come more perfectly into play, but, no colloid support being present, the pictures dissolved away in the fixing solution. Becquerel argues that his pictures are not due to the action of the same principle as those by Professor Lippmann, but gives no evidence in support of the contention; the former produced the pictures empirically and industriously, the latter seems to have revealed the true theory of obtaining such photographs in colors, and to have evolved law and order out of chaos. Here is M. Becquerel's utterance:

"I wish to point out the difference which exists between the purely physical process of M. Lippmann for reproducing the colors of light by photography, and the photochemical process which I discovered in 1848 for obtaining the colored images of the luminous spectrum, as well as the images of objects in their natural colors. I attained this end by means of one chemical substance—viz,, the subchloride of Ag formed on the surface of silver plates, the preparation and curious modification of which, under various influences, and notably under that of heat, I have already pointed out. Moreover, during the preparation of the sensitive substance, one can determine with precision the thickness of the layer required to produce the best possible results. This thickness may vary between one-four-thousandth and one-six-hundreth of a millimeter. These images are absolutely permanent in the dark, and I still possess reproductions of the solar spectrum made forty years ago, as well as images colored by light waves, which were the base of Regnault's report to the Academy in 1849. They are only spoiled when exposed to the action of light, because the sensitive substance with which they were obtained was not completely transformed, and is still liable to be acted on by various colored rays. M. Poitevin used the same substance in 1865 to obtain on paper the colored images which were produced by me on metallic plates.

"When one submits photographic images thus colored to the reducing action of one of the solvents of silver chloride, such as ammonia or hyposulphite of soda, the colored shades disappear, and on the spot where the luminous rays have exerted their action, a light trace formed by a thin layer of metallic silver remains on the surface of the silver surface, which, as long as it is still moist, shows feeble tints, the complementary colors of which had existed previously in the same spots. These effects, which *à priori* are difficult to explain, show, perhaps, that the thickness of deposited films plays some *rôle* in the production of color phenomena.

"This material, when duly prepared, enjoys the peculiar property of not only being sensitive to the action of various color rays, varying from red to violet, whilst reproducing their proper tints, but also of receiving an impression which appears in marked manner to be proportionally to the intensity of the corresponding luminous impressions on the retina.

"At the moment when the chemical reaction takes place, this photo-chromatically sensitive substance produces an electro-chemical current whose intensity and electromotive force can be measured with my electro-chemical actinometer. This current may be utilized for comparing accurately the intensities of the different active colored rays—*e.g.*, the red and blue rays—whilst the optical methods based on the impressions

produced by these very same rays on the retina do not allow of being made with anything like the same accuracy."

The undercurrent of prevalent interest in photographic circles about the new heliochromic discoveries was indicated last Wednesday night at the Photographic Society, when Mr. Warnerke departed from his subject to hand round a strikingly iridescent negative, the colors on which, he remarked, were no doubt like those obtained by M. Lippmann. Probably this is true. A few days ago a photographer remarked to a well-known scientific man, "Lippmann's discoveries are nothing but iridescence." "Very likely," was the rejoinder, "but perhaps hitherto we have not paid sufficient respect to iridescence."

Professor Lippmann uses a hypophosphite to fix his pictures, but in his letter to us stating the fact, the words following "hypophosphite" are so indistinctly written, that we cannot state the exact salt.*

ANTHONY AND BLAIR.

IMPORTANT NOTICE.

THE Blair Camera Company have recently purchased certain patent rights, owned or controlled by Messrs. E. & H. T. Anthony & Co., for the manufacture of amateur photographic apparatus, bromide and other papers, celluloid films, etc., as well as certain factories in New York and Brooklyn.

Messes Anthony & Co., having by purchase of stock, acquired an interest in the Blair Camera Company, arrangements have been made through which the products of all of the Blair factories will be sold by them as trade agents, as well as by the Blair Company.

OXALATE OF IRON PRINTING PROCESS NOTHING NEW.

To the Editors of the BULLETIN :

In an old number of a photographic publication I find the following, which will, I know, be interesting to amateurs who wish to print more than a blue color :

Mr. T. L. Phipson, Ph.D., says: "Many salts of iron are sensitive to the action of light, and a long time ago Sir John Herschel made experiments in this direction with citrate and tartrate of iron. The first experiments with oxalate of iron were made by me in 1860, and a photographic process based on the use of this salt was published in *Le Moniteur de la Photographie* for the 1st of October, 1861, and about the same time in the *Photographic News*—the oxalate of the peroxide of iron is, I believe, the most sensitive of all the salts of iron hitherto known, and if this salt had been used in the experiments formerly made by Sir John Herschel—this remarkably ingenious observer would, perhaps, have shown it to be equal to salts of silver—as it is, oxalate of iron has been used by Mr. Reynolds and others with very satisfactory results."

The hydrated oxide of iron must be precipitated by ammonia from a diluted solution of perchloride of iron. The precipitate must be well washed on a paper or calico filter with boiling water until the filtrate has no longer any taste of ammonia. Care must be taken that sufficient liquid ammonia is added to the chloride of iron to precipitate the oxide completely. The supernatant liquid should have a distinct odor of ammonia after liquid has been stirred. It is then transferred to the filter, the precipitate duly washed and strained, and is then dissolved in a hot and tolerably concentrated solution of oxalic acid. A beauti-

* Since the above was written Professor Lippmann has stated that he uses hyposulphite.—EDITORS OF BULLETIN.

ful green liquid is the result, which is evaporated to a small bulk over a water bath and allowed to crystallize. To obtain a most sensitive salt all these operations should be performed by artificial light. The salt crystallizes in very fine emerald green prismatic crystals very soluble in water, and paper impregnated with this solution is very sensitive to the action of light.

Some years ago I experimented with the above salt, and found that if the paper had been sized or coated with gelatine I got some very fine results, almost equal to first-class albumen prints. I did not crystallize the salt, but kept it in solution and have some now over two years old. I simply floated the paper on the solution, and when dry it keeps well. It is very rapid in printing, requiring but a few seconds' exposure in sunlight. After exposure, if you want blue proofs, develop by floating on a solution of red prussiate of potash and then wash. If you wish a warm brown tone develop on a 10-grain acid silver bath. If black tone is required, then use the silver alkaline. A fine purple-violet is obtained by toning with gold after the silver. When silver is used the proofs require a good washing; then run through a weak acid solution, one dram of muriatic acid to 20 ounces of water, then wash again. Over a year ago I sent you some proofs made in this way. You also can use gallic acid or pyro in developing.

T. C. Roche.

OUR ILLUSTRATION.

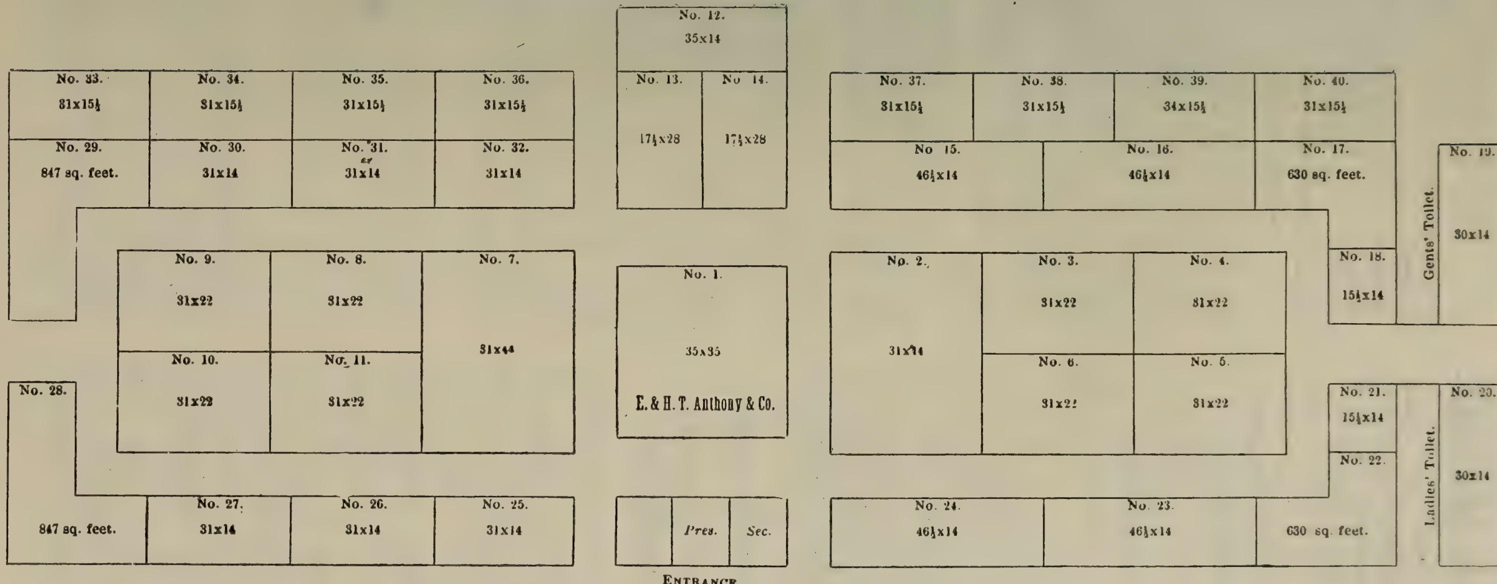
With this issue of the Bulletin we present our readers with some child studies made by Mr. G. M. Elton, of Palmyra, N. Y. Like all Mr. Elton's work they are artistic and full of feeling. They reflect the spirit of the artist who made them and whose work has been recognized by so many gold medals in competitions with the best men in the fraternity. Should any of our readers desire a series of these studies we believe Mr. Elton is in a position to supply them.

THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

Twelfth Annual Convention at Buffalo Park Association, July 14 to 17 (inclusive), 1891.

Rules and Regulations Governing the Merchants' Department.

1. Each space is marked by number on the diagram below. Hall is lighted entirely from the top; no dark corners. Those wishing space should make immediate application (by number); first come, first served.
2. No person can sub-let space.
3. All exhibits must be placed by 10 a.m., July 14th.
4. No exhibit will be accepted after the opening of the convention.
5. All bills for space must be paid on or before July 15th.
6. All freight and express charges must be prepaid.
7. No sign will be allowed in the hall larger than 3 feet in any dimension.
8. The art and stock departments will be closed each day from 10 a.m. to 12 m. to secure a large attendance at the meetings, and this rule will be strictly enforced.
9. Only exhibitors holding space can do business in the convention hall.
10. Any person not complying with the above rules will not be allowed in the hall.
11. Exhibits for the stock department to be shipped in care of W. A. Davis, Secretary Photographers' Association of America, care Buffalo Park Association, Buffalo, N. Y.
12. All applications for space to be made at once to W. A. Davis, Secretary, 872 Broadway, New York.
13. Price per square foot for space 12½ cents.



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ANTHONY'S

Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

SOMETHING NEW IN HAND CAMERAS.

We have lately had an opportunity of getting a glimpse of the new hand camera of the Blair Camera Company, and from all we could see it is a decided advance over anything of the kind yet attempted in this line. When we can obtain one to use for a little while we will let our readers know more about it. It is to be used with both glass plates and films on a roller, the latter being arranged in a novel manner in order to economize space. In fact it is the most compact camera of the kind that we have seen. In the next issue of the Bulletin we hope to give the details of its construction and an idea of its particular methods of operation. The name of this new piece of apparatus is the "Kamaret."

THE TOLEDO CAMERA CLUB.

The Toledo Camera Club wishes to make itself known to the amateur photographic world, it being one of the new additions to that body.

The club was formally organized in December last, and now has about 45 members of both sexes. The rooms 11 and 12 Hubbard Block, which have recently been occupied, are conveniently fitted up and contain all the paraphernalia essential to the development of every species of photography.

March 4th was the occasion of the first public reception and inspection of the rooms, which were thrown open from 2 to 7 P. M., followed in the evening at 8 P. M. by a stereopticon exhibit of amateur and professional slides, at the First Baptist Church, by Mr. Edmund Locke.

The church was well filled and all present evidenced keen satisfaction with the entertainment.

Mr. Locke prefaced the exhibition by saying that the views were developed from amateur negatives by an amateur slide maker, and were being shown and explained by an amateur talker.

With the exception of some professional slides, all the slides were made from negatives by Mr. Locke, H. E. Richards, D. L. Stine, T. H. Parkhurst, F. S. Anable, George H. Allen, E. L. Griffiths, and others.

The views were numerous and varied, and ranged from pastoral scenes around Toledo to excellent reproductions of the Coloseum at Rome, the church of Notre Dame, the ruined Palace of the Tuileries in Paris, the busy Seine, Picadilly in London, and the bridge-covered Thames and many others, the foreign views being from negatives by Mr. Stine and Mr. Locke.

Most of the club's apparatus was on exhibition at the rooms, arranged in a pyramid labeled "Our Battery," and the walls of the reception room contained many views of different kinds by members of the club.

Our regular meeting night is the first Monday in the month, with the remaining Mondays set aside as an informal meeting night. The club has officers as follows: F. S. Anable, President; E. L Griffith, Vice-President; H. E. Richards, Secretary and Treasurer; and D. L. Stine and George S. Waite, with the foregoing, forming the Executive Committee.

The club will be heard from in the future, and would be pleased to hear from some of our brethren.

H. E. Richards,
Secretary.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—B. L. H. sends pieces of print on card, and writes: Can you tell me the cause of the yellow spots and the remedy? I use ammonio-nitrate of silver bath, and have also used a tungstate of soda toning bath. The spots do not show until after the prints are washed and dried. Sometimes I will not see any for one or two weeks, and then they will come again. I have tried every remedy I can think of, but to no purpose. Also please give me a formula for a good acetate of soda toning bath, with directions for use?

A.—These spots may be caused by one of three things. First, iron in the wash-water. Second, some impurity in the paste used for mounting. Third, some impurity in the mounts. See if they disappear when another kind of water is used. We have seen just such trouble with iron water. Paste that has dust in it will also cause such spots. The dust of our cities is full of iron, and most minute specks of it would give such spots if this dust got into the paste. It is not uncommon also to find card mounts that will act this way, especially if they are cheap card stock and have not been carefully purified for photographic purposes. A good formula for an acetate toning bath is made as follows:

Gold chloride........	2 grains.
Sodium acetate........	20 "
Water..............	8 ounces.

Mix and allow to stand twenty-four hours before using. When using add enough sodium bicarbonate to make the bath decidedly alkaline to red litmus paper. Use the bath at a temperature of not less than 70 degrees Fahr.

Q.—G. G. I. sends a piece of a cabinet print, and writes: I use the improved Bradfish Aristotype paper and dry my prints about two days to get them thoroughly dry. When I burnish them hot to get a high gloss the pictures become spotted like the samples sent. I have tried every way to get rid of these spots. Has the paste anything to do with the trouble? I use starch paste with and without glycerine and the result is the same. I also have some trouble in getting a black tone on my prints. Has the toning bath to be cold or warm?

A.—The trouble with your prints appears to be due to the use of too much heat on the burnisher. Use less heat and a greater pressure. In the matter of toning, use a gold bath with a little sodium chloride in it, say 12 grains in 8 ounces of bath, and have it alkaline with sodium bicarbonate. Wash the prints in water with a few drops of ammonia in it before fixing.

Q.—Printer writes: Would you kindly inform me through your BULLETIN, of a reliable commercial method of polishing, or rather varnishing, unmounted silver prints. I have tried many methods, including polishing on a ferro or glass plate, and although that gives a very fine surface it increases the percentage of loss too much. I have heard of a varnish composed of white shellac and castile soap, applied with a brush, and said also to prevent curling; can you give me a formula for some such thing?

A.—The method of glacéing prints, is given in the last number of the BULLETIN, March 28th. The following formula is also recommended by H. P. Robinson:

Pure virgin wax.........	500 grams.
Gum elemi.............	10 "
Benzole................	200 "
Essence of lavender......	300 "
Oil of spike.............	15 "

Dissolve the elemi in the solvents on a water-bath with heat and filter, then mix with the melted wax. When finished, it is a stiff paste. If too thick, add more essence of lavender. This is applied to the prints in patches and rubbed over the surface with a soft piece of flannel. If a high gloss is needed, use more paste and rub evenly and more lightly. This formula is said to have been used by Adam Salomon.

Q.—Mrs. C. H. writes: Please tell me how to mix eikonogen developer. I always use distilled water and follow directions closely, still there is always some insoluble. I have used boiling water, and have dissolved the sulphite of soda first and then the eikonogen, but if it all dissolves when hot it settles out on cooling.

A.—You do not give us your formula, so we can only answer indefinitely. Eikonogen is only soluble in about 40 parts of water, and the sulphite does not increase the solubil-

ity to any great extent. If, therefore, you attempt to dissolve more than 1 ounce in 40 ounces of water, you will have some of it left insoluble. Some samples of eikonogen do not dissolve perfectly even in 40 parts of water, but the insoluble matter is usually very small and may be disregarded.

Q.—T. G. A. writes: Will you oblige a subscriber to the BULLETIN by answering the following questions? What is the cause of the changing of good blue-toned prints to red in the hypo bath? They remain in the bath for twenty minutes, and the bath is made of hypo, 1 ounce; carbonate of soda, ¼ ounce; water, 8 ounces. They come out very red like half-toned prints. Also tell me which is best to neutralize a silver bath, sodium carbonate or ammonia?

A.—We think the trouble is with the sodium carbonate. Try 1 dram of liquid ammonia to a quart of plain hypo and no carbonate. The quantity of soda used is altogether too large anyway. We prefer to use ammonia to neutralize the silver bath.

Q.—C. C. K. writes: I have been bothered for some time with my silver bath. When I lift the paper off the bath it looks as if it had been greased. I can overcome the trouble by rubbing the surface of the paper with a piece of cotton, but that is a big job when I am busy. I use a 60-grain bath and float two or two and a half minutes. Is there any way to remedy the trouble?

A.—Your trouble is caused by the albumen paper being too dry. Keep the paper in a damp place for twenty-four hours before using it, or hold it in the steam of a dish of hot water for a few minutes. Your silver bath is also a little too strong, 50 grains is strong enough with good paper like the N. P. A.

Views Caught with the Drop Shutter.

MR. THEO. MARCEAU, of San Francisco, Cincinnati and Indianapolis, who sails for Europe in the latter part of May, with Mr. Steffens, of Chicago, gave us a call lately. These gentlemen are to establish a mammoth first-class studio in Paris on American ideas. We do not doubt that the venture will be a success with such a duo to engineer it.

WE note the incorporation of the NOVELTY PHOTOGRAPHING COMPANY in Chicago for the photographing on silk, satin, cloth, etc., and the giving of lantern entertainments. The incorporators are H. B. Simington, E. W. Houser, V. C. Houser and Nina L. Houser.

L. S. PAGE, of Emporia, Kansas, was burned out at 522 Commercial street on the morning of March 13th, last. The building was a total wreck, and the loss $15,000; insurance, $7,000.

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NEGATIVE BY THEO. BRINKMEIER. HELIOTYPE PRINTING CO.

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MADE WITH ANTHONY'S 2 B EQUIPMENT.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. APRIL 25, 1891. No. 8.

THE INFLUENCE OF THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

In a recent number of the *New England Magazine* we noted the following statement:

"A painter is not necessarily an artist, nor is a photographer debarred by the character of his calling from being one. In a word, photography is what the photographer makes it—an art or a trade."

These remarks were called forth by a review of the prize pictures of the Photographers' Association of America. The writer of the article, Mr. W. H. Downes, notices the work of Rösch, of St. Louis, and commends it to the consideration of all those who think that photography is not an art. Speaking of the model in the first picture of the series illustrating "Evangeline," he says: "The lines of expression in the countenance bear out the idea of serenity and religious exaltation, and the conception is thus realized with a degree of success which is worthy of great praise." Of the second picture, where Evangeline is in the garden in Louisiana, he says: "The whole picture is alive with emotion and meaning. It is like a statue of patient emotion and humble appeal." Passing to the third picture, the writer speaks as follows: "The climax of the narrative, when Evangeline finds Gabriel dying in the almshouse, is an episode of unrelieved tragedy. A glance shows that the picture is strongly dramatic in the best sense of the term."

Coming to the pictures of last year, the writer makes particular note of the trio of G. H. Hastings, of Boston, that took the grand prize. Of the picture where Annie is seated by the empty cradle, he says: "This is a genuine picture. The composition looks like the reproduction of a good painting."

Commenting on the results of the competitions of the past, the writer continues: "The faults have been more often faults of judgment than of taste, and we are justified in concluding that the competitions of the past two years were worth while, and have yielded welcome and encouraging results."

When we see the work of the Photographers' Association of America calling

forth the praise that the above extracts reflect we are constrained to believe that the course hitherto pursued by them is the correct one for the advancement of American photography.

The liberal provision made by the officers for all classes of the fraternity should call forth a large number of pictures for the exhibition. The influence of the association on American photography, during the past five or six years, is obvious to all who have watched the work of the better class of photographers in our large cities. There is more good artistic photography to-day than was ever before seen in the history of the art. And this has come about by the association of some of the leading workers in the art, for the purpose of elevating the quality of photographic productions. We know from personal acquaintance with these workers that for years they have toiled hard to bring about the results that only now are beginning to reward their labors. And it is not the photographers alone that have done this work of putting new life into the photographic art in America. To be just we must remember that the merchants that supply the apparatus for the production of the pictures have also had a lively interest in the advancement of the art. Almost every year we see them giving their best energies to the promotion of the convention of the Photographers' Association, and in spite of cries of personal interests and other carping expressions, we hope they will continue to do so for many years to come. It must be remembered that the manufacturers could not exist if the art did not flourish. It must also be remembered that an art will not flourish if all the artists do not work together for that purpose.

We feel that the time has come when photographers now recognize that their calling is one of the results of the advance of modern civilization, and to excel in it they must learn the methods of that civilization, the union of interests for the common good and not for any individual advancement. In these times individual advancement is out of the question if the progress of the fraternity is neglected, and to know the best way to encourage the best interests of the fraternity one must take part with those who have already pointed out the road to success.

That the Photographers' Association of America has become a national and potent influence, no one who looks at its work of recent date will gainsay. The new order of things in artistic photography that is seen on all sides and that has called forth the admiration of our true friends is largely due to the yearly conventions of this association.

We do not mean to say that all the work of the association has been an unqualified success, but we do say that, looking back over the past records of its endeavors, we believe that the good it has done is substantial and in the line of permanent advancement for American photography. The mistakes made in the past cannot occur again, and were more the faults of immature organization than any weakness of the methods of the association. Everything points to a bright future for the organization and to a better feeling amongst its members. They now feel the strength of union and must necessarily have an influence on the future development of the art.

Every photographer that has an interest in the progress of his profession should look into the work of the association and determine for himself if he is not also called upon to give his influence to help the good cause along. Remember it is growing and will continue to grow in spite of all the cold water

that some appear to be throwing upon its work. All that is necessary is steadfast work from those who believe in it, and above all things a belief in themselves on the part of photographers. The work has only fairly started and much remains to be accomplished, but the union of all photographers for the purpose of advancing the art, and incidentally themselves, will put this profession on the same footing as any other. The greater the number of those who help the movement the less will be the effort of any one individual, and in the larger interest that will be taken in the affairs of the association, we shall also have a broader scope for its work, and the greatest good will come to the greatest number. We could suggest many things that the association could take up for the benefit of the fraternity, but we believe that the officers have done the best they could for the progress of American photography up to the present time. We hope for many things in the future and will always do our best for the good cause. We have faith in the men at the head of affairs, and the reward that they will obtain must come from a knowledge that they have labored faithfully in a good cause.

Those of our readers who contemplate a journey to Buffalo in July should not only send their contributions, but they should also send some of their work. Remember it is important that you should take an active part in the work of the association, as well as to supply the necessary funds for the prosecution of that work. Indeed it is more important for you to help to elevate the art than is at first apparent. The progress made depends on the work of those who take part, and none can be made if none take part. Let this, then, appeal to you personally.

EDITORIAL NOTES.

A METHOD of intensification with silver comes to us from one of our exchanges which is very highly recommended. It is as follows:

The negative is bleached in—

Copper bromide	1 ounce.
Water	20 ounces.

The longer the gelatine is bleached the greater will its density be. Wash thoroughly and immerse in

Nitrate of silver	100 grains.
Distilled water	20 ounces.
Glacial acetic acid	1 ounce.

The negative, after becoming thoroughly black, should be well washed. Both solutions keep well.

Copper bromide may be obtained by combining in equal parts the two solutions.

SOLUTION NO. 1.

Sulphate of copper	½ ounce.
Water	10 ounces.

SOLUTION NO. 2.

Potassium bromide	½ ounce.
Water	10 ounces.

This combination should be used immediately after mixing.

Miss CATHERINE WEED BARNES gave a very practical and entertaining lecture

before the Young Woman's Union, of Syracuse, on the 30th of last month, in which she strongly urged the advantages to be derived by wage-earning women from the field of photography. A lantern slide exhibition followed, which was made up largely of work from the hands of the lecturer.

At the recent annual dinner of the Society of Amateur Photographers, given at Sherry's, a gas flash-light negative was made by Mr. T. J. Burton with a lamp of his own invention.

The question of how to color slides is one which frequently haunts the amateur, and while it is next to impossible to give any set form of instruction in the matter, we may safely say that only transparent colors should be used, such as gamboge, Italian pink, Prussian blue, burnt sienna, crimson lake, etc., which are in any way adapted to the work; they may be either oil or water colors, but *must* be transparent to give good results; they may be thinned down with megilp, Robinson's medium or mastic varnish, but the great difficulty will be found in obtaining the knack of laying them on in such a way as to give a smooth, soft and even effect of tone.

In these days of unmounted photographs galore, it is a good thing to know that hot gelatine applied with a small sponge to the back of the prints which have previously been thoroughly dampened, serves as an excellent medium for mounting them in the scrap-book. The surplus of gelatine should be wiped off the mount with a second sponge wet with clear warm water, and the print pressed down with a clean towel.

We are in receipt from W. L. Minns, of New London, Ohio, of some landscape studies and portrait work which for a beginner show many good points, the modeling in the portrait work being very good. It is evident that he is studying to become thoroughly acquainted with his subject, and if he continues as he has commenced we shall look for more results in the future.

A very interesting and valuable method of collotype printing comes to us from the other side from the pen of Mr. A. V. Lavroff, of Russia, who prepares a sheet of plate glass with bichromate of potash in the ordinary way, and after exposure under a negative and washing with cold water, allows it to dry for twenty-four hours at a temperature of about 70 degrees Fahr. He then covers the plate with the following solution, which serves to etch the impression:

Water	100 c.c.
Glycerine	200 "
Hyposulphite of soda	2 grams.

He leaves this solution on the plate from one to two hours, as the density required is more or less, when it is removed with a sponge and blotting-paper, and the plate inked up. Prints may then be made in an ordinary letter-copying press, taking care to place an india-rubber cloth beneath the plate and using a soft pad of cotton or some similar soft and smooth material over the sheet which is to be printed, to insure perfect contact with all parts of the plate. If, after a few prints have been made, the plate becomes flat and the high lights gray, it may be renewed by simply moistening with the etching solution again. A mask of paraffine paper or parchment paper soaked in oil and dried should be used to prevent the edges of the paper from becoming soiled in printing.

The Photographic Society of Philadelphia gave a very enjoyable lantern exhibition early in the month, showing upward of one hundred and thirty beautiful views of Switzerland, with its mountains, valleys and glaciers, from the collection of Dr. Charles L. Mitchell, who added much to the pleasure of the evening by his delightful explanations and descriptions of the scenery.

At the first photographic exhibit of the Agassiz Association, diplomas were awarded to the following gentlemen for the best work in the several classes for which they entered: Mr. H. T. Rowley, H. Bucher, Jr., F. Albers and W. T. Demarest. The judges were Messrs. L. W. Seavey, A. T. Schauffler and E. W. Newcomb.

Great things are expected from the new Bruce telescope which is in course of construction at Harvard University Observatory. The amount of wonderful information to be gotten out of stellar photography is to the greatest degree surprising, and study in this direction is constantly disclosing new wonders. The Bruce instrument will be the largest of its kind constructed, and will have an aperture of 24 inches. We wait with impatience its completion, and anticipate with interest the results it may bring forth.

We would acknowledge the receipt of samples of portrait work from A. W. Howes, of Turner's Falls, Mass., which show capital lighting and treatment generally, as applied to children.

The Photographic Society of Waterbury seems to be in a state of extreme health and prosperity judging from the number and quality of their entertainments, two having been given in March, both of which were of a high order of merit. Mr. C. R. Pancoast still maintains his interest in the society and his efforts are of great value in keeping matters alive in that section of the country.

It has been suggested that it would be well if some universally acknowledged sign or mark could be adopted and used by amateurs in printing from their negatives, by which they might be known from those of professional people; and the combined letters *Æ* has been named as being well suited to the purpose, as standing for *Amator Fecit*.

Photography now forms one of the very important parts of the outfit for parties exploring new countries, and we are pleased to note that the expedition to Central Africa now being fitted out by Lord Randolph Churchill is to be very fully equipped in this department. We note too, that they will take with them as a substitute for plates, several hundred of Carbutt's well-known negative films. We understand that the London Stereoscopic Company is supplying the entire outfit for this expedition.

We are in receipt of several very fine views of the recent exhibition of citrus fruit, held in Los Angeles, Cal., made by Hill, of Pasadena. The subjects are most difficult of manipulation, and are handled in a manner which shows the artist's thorough knowledge of how to make every use of opportunities and to get out of his plates all there is in them.

It not infrequently happens that the professional photographer is expected to photograph the society lady in the guise and pose of her professional sister, and he is often unable to convince her that the accomplishment of her expectation is impossible, and yet it would seem that anyone might realize that the result of a life of study in facial expression (aided by carefully studied make-up) and pose is not to be grasped at will by the chance sitter, to be put on and thrown off as a cloak.

The Boston Camera Club recently gave a most enjoyable evening's entertainment in the way of an exhibition of magic, which was provided by an amateur of large experience.

A most interesting and instructive series of negatives has lately been obtained at the National Museum, Washington, by which it has been shown that the well-known "Fairy Ring" mushroom is the result of the rapid growth, death and decay of many offspring from a single plant, which exhaust the nutrition in the soil so rapidly that those in the center of the ring are constantly dying from lack of nourishment, leaving only those on the outside of the group to flourish and draw their sustenance from the unexhausted soil beyond them.

[*From our Special Correspondent.*]

ENGLISH NOTES.

By the time the readers of the Bulletin peruse these notes, the fine new premises of the London Camera Club will have been completed. I inspected the premises a few days ago, and from the dark-room in the basement to the studio on the roof, have nothing but praise for the arrangements. No other photographic club or society on this planet has so extensive, comfortable and commodious a home. The Camera Club now numbers 700 members, and I expect this number to rise to 1,000 before the end of next year. Great credit is due to the Club Librarian, Mr. Lyonel Clark, for the efforts he has made, and is making, to bring together a thoroughly good collection of books bearing on photography. It may surprise some workers who do not know how rapidly the literature of the subject is growing, to hear that the Camera Club Library receives, annually, sixty-three periodicals directly connected with photography.

I also visited the new rooms of the Photographic Society of Great Britain, at 50 Great Russell street, opposite the British Museum. The rooms form a "flat," four stories up. The premises are new, and there is a handsome *suite* of rooms on the first floor, which (although doubtless at a much higher rent) would have made a really suitable home for so important a society. The new assistant secretary, Mr. Lawrance, is a good worker and is doing his best; but I can't help thinking that those dreary flights of stairs will prove a serious drawback. No doubt the right thing to do, and the thing which would most powerfully aid the progress of photography in this country, would be the fusion of the Photographic Society of Great Britain, the Camera Club and the "Convention," into one strong body, to which all the other photographic societies should be allied, so as to form a federation. But it is to be feared that personal feelings and interests will for some time prevent this most desirable combination.

The annual report of the Kew Observatory states that the authorities hope soon to be able to test photographic lenses, etc., in the same way as they

now do other scientific instruments, such as barometers and thermometers. A fee will be charged, and a certificate stating the exact character and performance of each lens will be issued.

What shall I say of Professor Lippmann's discovery of photography in colors in Paris? Simply that its interest is theoretical, rather than practical; nor can I see much chance of practical success. A collodion emulsion film of the finest grain and of extreme tenuity is exposed for about two hours to the light of the spectrum while in contact with pure mercury (the light passing through the glass). The colored light is reflected from the mercury and passes back through the film, meeting the entering waves of light, and producing a deposit of silver in layers according to the wave-lengths of the colored light. After fixing (in the usual way) the film still retains traces of the spectrum colors, more or less vivid according to the fancy of the observer. The effect is interesting, but not, at present, of any practical value.

Not to be behindhand, we find an English inventor, Mr. Varley, declaring that he has discovered, in conjunction with Mr. Friese Greene, a method of making an iron salt as sensitive to light as a silver salt; and which can be developed and fixed in the same way. Pending the publication of the patent no details can be made public; but some of the results were exhibited the other evening at the Society of Arts. It is to be hoped that the affair will turn out better than Messrs. Varley and Greene's previous "inventions," which have been equally wonderful (upon paper), consisting of marvelous cameras, lanterns, etc., which have always been going to do something wonderful, but of which we have never seen the results.

The Photographic Exhibition at Liverpool, which has just closed, has been a successful one. The catalogue included a brief history of the photographic art (more especially referring to the share taken by local workers in its advancement) as introduction; while half-a-dozen capital reproductions of the leading pictures helped to still further lighten its contents. There was a special class for "flash-light" pictures, in which an Italian lady—the Countess Loredana—showed to great advantage. But, will anybody tell me how to differentiate a "flash-light" picture?

It is pleasant to note the spread of photography in every direction. The *Boys' Own Paper*, which has a circulation of over 200,000 monthly, now makes quite a feature of work with the camera, and in its last number I see it again offers prizes to the amount of ten guineas for the best pictures by juveniles. There is no doubt at all but that the training offered by the necessary operations in photography is just the thing for the growing boy (or girl); and a cheap but strongly made and light-tight camera, with appliances, is the best and most acceptable present that can be given to the junior members of a family.

Is not the speed of shutters vastly exaggerated by their makers? With a friend I have just been testing the speed of a number of shutters, and I find a shutter that will give an exposure of less than the hundredth of a second to be quite a rarity. Marion's "Crown" shutter (Bain's patent) gave the hundred-and-fiftieth part of a second, and that was the most rapid of the two dozen shutters which we tested. Mr. Muybridge (who has lately been lecturing in various English towns) spoke of the exposures he had given which he calculated were as short as the five-thousandth part of a second; but I consider this a great exaggeration. He is now lecturing in Berlin, but the Germans consider his

work to be very inferior to that of Anschutz, and to show no advance on what was done fifteen years ago.

The Easter holiday has been a success. The weather has been fine and sunny, though with cold winds. One wonders how many plates have been exposed, and how many good negatives obtained? It would be interesting to know the proportion which the one bears to the other. And how many of the "shadow-snatchers" give a thought to the man who made the first gelatine emulsion dry plate—Dr. R. L. Maddox—now living at Southampton? It is thirty years ago since he first published his discovery, and the only acknowledgment he has ever received has been a gold medal awarded by the jury of the "Inventions" Exhibition of 1884. To my private knowledge he has during all this time suffered almost incessant pain from an internal disease. Would it not be a graceful act for the photographers of the Old and New Worlds to unite in doing something which should sweeten the veteran's later years? He has made the fortunes of many; he has given a new source of pleasure to millions. Ought we not to thank him for it? And let it be remembered that Dr. Maddox has done almost as much for microscopy as for photography. I may add that I am delighted to hear that this "grand old man" has written a paper for the new volume of Anthony's "International Annual," a book which promises to be—like its predecessors—an "easy first" among the publications of its class. Its appearance in England is awaited with impatience by thousands, but by none more eagerly than TALBOT ARCHER.

THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES.

(*Continued.*)

The Emulsions.—The emulsions were produced under the following conditions. As each plate had to be examined, both for its absorption as well as its spectral sensitivenesss, the emulsions had to be as transparent as possible so as not to absorb too much light; in other words they had to be what is known as "fine grain." Plates however coated with such emulsions are not very sensitive. Eder in his recent work, "Photographie mit Bromsilber Gelatine," page 178, refers to the difficulty to be encountered in following up such experiments: "Dye-stuff solutions give quite different absorption spectra from that of the dry dye-stuff. It were best to employ colored silver bromide films; these, however, are prepared with difficulty, so colored gelatine films had to suffice."

The color addition had to be made in a suitable quantity to produce a sufficiently visible absorption. This had also the effect of considerably lowering general sensitiveness, especially with many of the aniline colors where an addition of ammonia could not be made to raise general sensitiveness. In some cases it required many experiments before good results were obtained.

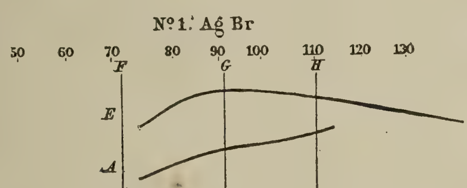
The amount of dye-stuff in proportion to that of silver bromide present varied considerably, and ranged from .5 to as much as 25 per cent. by weight. In most cases the plates used for absorption were thinner coated with emulsion than those which were used for photographing their own spectral sensitiveness.

In order to photograph absorption spectra, a plate had to be produced which was sensitive without interruption from ultra-violet to extreme visible red, without showing either maxima or minima of sensitiveness. I experimented to this end

with various dye-stuffs and organic bodies containing different dye-stuffs, but without result. Success, however, attended my efforts through using Jaborandi Tincture.

This tincture contains besides alkaloid a considerable proportion of a greenish-yellow dye-stuff (probably some chlorophyll). The tincture can be added either before or after (best before) the production of the emulsion. The presence of ammonia, as well as the least possible excess of silver nitrate, is necessary for the purpose of increasing sensitiveness. It is not, however, always easy to obtain good results alike; out of nine or ten emulsions I made, only about three were fit for use—such uncertainty when one forsakes a beaten path is only too well known in emulsion-making. A plate coated with the above sensitized emulsion should show from about F toward the refrangible end of the spectrum a sensitiveness curve like that of ordinary silver bromide plates; from F to B the sensitiveness decreases to about one-third and remains practically uniform throughout the whole district, showing when properly made neither maximum nor minimum. In some cases a weak maximum may occur at C which in other cases is scarcely to be observed. These plates are, however, very slow—about 100 times slower than ordinary plates of commerce.

Drawings.—These were made from negatives, and are shown in the table. The curves E_1 E_2 E_3 correspond always for sensitiveness: a, the absorption of the simple dyed gelatine film, a_1 a_2 a_3 to the absorption of the dyed silver bromide film; a_1 and E_1, a_2 and E_2, etc., each refer to the same emulsion. The small numbers indicate the number of experiment in note-book, and are referred to in the text. I might here state that this work has just been published in "Wiedemann's



Annalen der Physik." The table of drawings was prepared for the German publication, and consequently the names of dyes and one or two other details are written in that language. The difference between the English and German names appears so slight that I do not think I need do more than allude to the fact.*

Observations.—Silver Bromide Emulsion.—The determination of the spectral absorption of silver bromide was, through several causes, surrounded with many difficulties. These were threefold. I. The maximum of sensitiveness of AgBr stretches over a pretty wide spectral district, and is nowhere very strongly defined. II. There is absorption over the whole district to which it is light-sensitive. III. The want of a suitable plate on which to photograph its spectral absorption.

The difficulties I and II must necessarily remain. To overcome No. III I have photographed a series of absorption spectra of AgBr (See Nos. 1, 2, 3 AgBr) upon plates of somewhat different spectral sensitiveness—*i. e.*, α, upon the AgBr plate itself; β, upon AgBr, AgCl plate; and γ, upon an AgI, AgBr, AgCl plate under the following conditions:

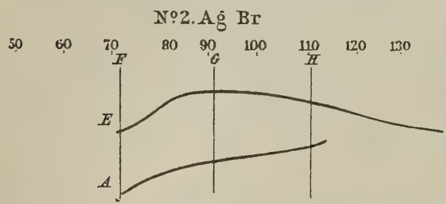
1. The optical parts of the spectroscope of glass and the light a Welsbach gas-

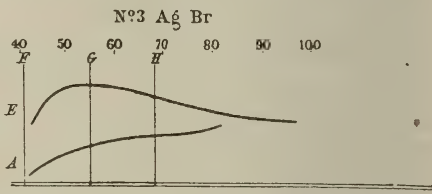
* This refers especially to drawings that are to follow in succeeding issues of the Bulletin.—Eds.

burner. Drawing No. 1 shows curves obtained. *A* is curve of absorption; *E* is curve of sensitiveness—(No. 1 AgBr.).

2. The optical parts of the spectroscope of glass, the light-source being sunlight reflected from a heliostat. The curves here obtained are practically similar to No. 1, and in both cases the sensitiveness maximum in comparison with the absorption maximum appears to be displaced toward the red end.

3. The optical parts of quartz, the light-source being glowing zirconia. In





this case in estimating sensitiveness, I placed between the light-source and slit a double film of gelatine and celluloid. For estimating absorption, in order to avoid the use of glass entirely, I used a film of gelatino-bromide of silver prepared as follows: A glass plate was first of all coated with a suitable solution of celluloid, and when dry coated with gelatino-bromide emulsion. After this was dry (in dark room) it was stripped off the glass. By this means the only difference in the quality of the light-source during determination of sensitiveness and absorption lay in the presence of AgBr. By examination of a series of negatives upon different plates and by different exposures, I received results which are similar to those obtained under conditions of 1 and 2. Although it is difficult to make out exactly where the absorption maximum really lies, yet I believe to be able to conclude with certainty that the absorption, as a whole, and naturally its maximum, is, in comparison with the sensitiveness maximum, displaced toward the more refrangible part of the spectrum and similarly to the drawings already referred to, and as also indicated by the drawings relating to the dyed emulsions following.

Aniline Dyes.—These colors show very little inclination to combine with silver salts. They are characterized as a rule by causing a very great loss of general sensitiveness. In many cases, in consequence of their slight solubility in water or in water and alcohol, it was impossible to employ a sufficient proportion in order to get the most satisfactory effect.

(*To be continued.*)

PHOTOGRAPHIC SHUTTERS.

BY FRANCIS BLAKE.

(*Continued.*)

Now the results which have just been given hurriedly have probably made but little impression on the minds of most of those who are present. A few of you may have had an intelligent interest in the statement of results obtained with some particular shutters with which you are familiar, but in general you probably have but an indistinct memory of a lot of unintelligible figures. Nevertheless, if you had had time to carefully digest the results obtained, I feel sure that you would have reached the conclusion that the average working speed of commercial shutters is about three hundredths of a second; and that

while a few of these shutters may be forced to come well within this average speed for test purposes, they are made to do so at the expense of so great a loss of light that they are of but little practical use when so forced.

Three-hundredths of a second is too slow a speed for photographing the quickest motions of animate or inanimate nature; and the successful pictures obtained with shutters of that speed are due to the fortunate coincidence between the moment of exposure and a slower phase of motion. Thus, with such a shutter, the most rapid phases of motion produce blurred plates, which are thrown into the waste box; and science receives but a few special—and therefore misleading—data, in place of the many which the art of photography should be made to yield. This generalization forced itself upon Mr. Hubbard and myself, after two years of patient experimentation with every conceivable form of shutter applied before, between or immediately behind the lens; and, at his suggestion, we then abandoned all work in that direction and devoted ourselves to the perfection of the focal-plane shutter as described in the quotation from Sutton at the beginning of this paper.

I know of no commercial shutter which passes more than 50 per cent. of the light which falls on the lens during its action; while the focal-plane shutter has been lying idle for twenty-five years, in spite of its ability to pass close on to 100 per cent. What may be called the "light advantage" of the focal-plane over an ordinary shutter is well indicated by the following considerations:

With any form of shutter in which a slot 1 inch in width passes at a uniform velocity directly behind a lens 1 inch in diameter, the sensitive plate will receive but 50 per cent. of the light which falls on the lens during the action of the shutter. Supposing the lens to be 5 inches in focal length, if the slot is merely moved backward to within one-quarter of an inch of the plate, 95 per cent. of the light falling on the lens during the action of the shutter will reach the plate.

Further consideration of the subject shows that in any single shutter placed immediately before, between or behind a lens of 1-inch opening, the percentage of light passed is equal to the number of inches the slot travels less one times the units of light per inch. Thus a 1-inch slot travels 2 inches in uncovering and covering the lens. Calling the total light falling on the lens during the action of the shutter equal to 100 units, we have 50 units to each inch of slot travel. Slot travel 2 inches minus $1 = 1$ inch times $50 = 50$, which is the percentage of light passed.

A 2-inch slot would travel 3 inches, and there would be $33\frac{1}{3}$ units of light to each inch.

$3 - 1 = 2 \times 33\frac{1}{3} = 66\frac{2}{3}$, the percentage of light passed. Continuing the computation, it will be seen that a 3-inch slot would pass 75 per cent.; a 4-inch slot, 80 per cent.; and so on until in order to pass 90 per cent. of the light, it would be necessary to have a slot 19 inches long pass by the lens in the same time that the focal-plane slot passes over five-hundredths of an inch, which is the diameter of the cone of rays from a 1-inch lens of 5 inches focus at a point one-quarter of an inch in front of the sensitive plate. Opposed to this tremendous advantage, there is only one theoretical objection to the principle of the focal-plane shutter; and that is that all parts of the sensitive plate are not exposed at the same time. But practically this objection does not hold good, since the velocity of slot motion may be made so great that there is no sen-

sible distortion of the phase of motion of the moving object. Moreover, the possibility of any distortion may be eliminated by setting up the camera at such a distance from the moving object that the angular value of its image on the sensitive plate shall be equal to or slightly less than the width of the shutter slot.

The focal-plane shutter which I now show you is the outcome of the experimental work carried on by Mr. Hubbard and myself during the last four years. It consists of a mahogany case attached to the backboard of a $6\frac{1}{2} \times 8\frac{1}{2}$ camera. The case is $18\frac{1}{2}$ inches long, $9\frac{1}{2}$ inches high, and $\frac{7}{8}$ inch thick, outside measurements. At its centre is an opening in which may be placed a focusing screen or a 4 x 5 plate-holder.

Within the case are two screens, $5\frac{1}{2} \times 5\frac{3}{4}$ and $4\frac{1}{2} \times 5\frac{3}{4}$ inches in size. They are made of a very light framework of bamboo, covered with thin tissue-paper rendered thoroughly light-proof by the application of a mixture of lamp-black and shellac. These screens run freely on two brass wires strained lengthwise across the wooden case above and below the plate-holder opening.

Attached to the base of the larger screen is a piece of thin sheet steel pivoted to the corner of the base at one end and divided on its lower edge into ten notches one-tenth of an inch from centre to centre. Attached to the opposite corner of the base of the smaller screen is a screw stud, over which the notched piece may be slipped. By this simple bit of mechanism the two screens may be at will attached to each other, with a slot between them varying from $\frac{1}{10}$ of an inch to 1 inch in width by tenths. The exposure is made while this slot is passing over the sensitive plate, motion being imparted to the screens by means of a steel pin connecting them with a wooden piston, which in turn is driven through a brass tube by compressed air.

With a $\frac{1}{10}$-inch slot in connection with a 2 B Dallmeyer lens three tests for speed of this shutter have given the following results :

First test	0.0006
Second test	0.0006
Third test	0.0005
Mean	0.0006

This speed, which we may call half a thousandth of a second, is a severe tax upon the ability of the most rapid lenses and plates to produce pictures. It is obvious that the speed of the shutter may be increased to any desired extent by simply narrowing the width of the slot; but until the market affords us quicker lenses or plates there will be no practical advantage in making exposures of less than half a thousandth of a second.

The lantern slides of pigeons in flight, which will now be thrown upon the screen, were made from negatives taken with this shutter, using a slot two-tenths of an inch wide. The length of the exposure was therefore one-thousandth of a second ; but you will note that the eyes and feathers of the birds are as sharp as if they had been standing still.

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

COLOR PHOTOGRAPHY.

Speaking of the discovery of Professor G. Lippmann, Dr. E. Stolze in the *Photographische Nachrichten*, makes the following remarks:

It is said that they are "interference appearances" upon which the colors are based, and these are to fix in the film so to speak the wave lengths of the colors, as the voice is fixed upon the cylinder of the phonograph. That sounds very nice, but it agrees very little with our physical knowledge. The color of these scales by transmitted light is of course complementary to that appearing by reflected light; but colors appear generally only when the film is very thin, and disappear as soon as the thickness is more than the fraction of a millimeter, in the atmosphere, for instance, 0.001 mm. Lippmann, on the contrary, has glass plates, mostly 2 to 3 mm. thick, where, therefore, these appearances cannot take place; it is also to be considered, that we have to treat here with the spectrum, therefore, with monochromatic light at every single place. With this, the different thickness of the film represents itself by greater brightness or darkness, both interfering waves either increasing or reducing each other. But this does not, perhaps, mean that single parts of the light sensitive film do not vibrate at all, or others stronger, and that opportunity was therefore given for it, that during development, reduction of silver would take place in one spot, and in the other it would not, but only that all particles vibrate more or less strongly. Even if the glass would be thin enough to produce interference, such light and dark layers could not form in the film as above mentioned. Still less comprehensible it would be why plates containing actually such layers should show complementary colors by striking and passing light. All the conditions which produce this appearance in the actual observation of the films are wanting here. If the wave lengths are reflected actually, so to speak, in the film, only one color could appear always in the reflected as well as in the passing light. But a still more important circumstance is to be added to this. In homogeneous single colored light, which is the light for the spectrum, thin films appear in the transparency as well as upon the surface of the same color, and the difference is only that if in consequence of the thickness of the film reflected light appeared lighter, passing light would be darker, and so reversed. In this point is the appearance so described by Lippmann in direct contradiction to the physical appearance, and therewith it is clear that the attempted explanation is impossible. But this would then be—always providing the correctness of the experiment—a new point to the many others on which the present theory of light could be attacked. The question about the possibility of picture productions in this way might be answered that for positive observation the glass plates should have a black ground on the back, while for negatives they might be applicable as they are. Diapositives, in any numbers, could be made from said negatives, which would serve again for the production of surface positives. Finally, we beg to consider yet, that the light reflected from the back would, according to the character of the sensitive film, be variously colored; that is weakened, and might also fall upon other parts of the film than the corresponding ones, and leave a halo. This is already partly the case when making a spectral view, and is there only less injurious, because the adjoining picture parts have always related colors. For real pictures this would be entirely different.

[*From Photographisches Rundschau.*]

THE ORIGIN OF YELLOW SPOTS UPON NEGATIVES.

BY ALFRED STIEGLITZ.

How is it that yellow spots appear suddenly upon negatives after their being fixed and washed thoroughly more than a year? This was a conundrum to me recently. One of the best negatives I ever made was taken three years ago at Venice. It was carefully washed for two hours in running water after fixing. The first thing I did after my return to Berlin was to go to my laboratory and varnish the negative, so as to protect it better for printing purposes.

Lately I looked for the same with the intention of using it for a new printing method, and, after being found, I discovered to my great consternation a large yellow spot right in the middle of the negative. After some reflection I explained to myself the peculiar appearance in the following manner: The negative was probably only seemingly fixed, but not chemically! this the reason for the later appearance of the yellow spot. But what is the difference between fixing seemingly and fixing chemically? To comprehend this it must be known that the fixing of a negative in hyposulphite of soda has to undergo two chemical processes.

First.—The hyposulphite of soda dissolves the silver bromide on the plate, not affected by light, and by this action the plate becomes transparent. The bromide of silver acts upon the hyposulphite of soda in such a manner, that an atom of Ag takes the place of an atom of Na; but as two atoms of Na are present in a molecule of $Na_2\ S_2\ O_3$ (hyposulphite soda), a double salt will form which contains hyposulphite of silver and $Na_2\ S_2\ O_3$. The atom of Na, which has taken the place of Ag, connects at once with the atom Br, that is, two compounds have formed, the silver double salts and NaBr (bromide of sodium). The plate is now seemingly fixed but not chemically.

Second.—The silver double salt is now soluble in an excess of $Na_2\ S_2\ O_3$, and it forms $Ag_2\ S_2\ O_3$ (hyposulphite of silver), and only after this the soluble salts, contained in the gelatine, are removed by thorough washing. This second part is the chemical fixing.

To prevent a plate from being taken too early from the fixing bath which apparently has been sufficiently fixed, it has been proposed to apply two fixing baths, that is, after the plate has become fully transparent in the first bath, to put it in another fresh bath, so as to be fixed chemically. Only after the second bath the plate should be washed, and this will prevent any future spots that might appear. Such doubly-fixed plates can also be intensified without the least danger, thus avoiding the frequent disagreeable appearances.

[*From Photographisches Correspondenz.*]

BENZOLE, BENZINE, TOLUOL AND THEIR DISTINCTION.

BY ALEXANDER LAINER.

Benzole, as is well known, is a very important liquid for the production of mat-varnishes, which causes the mat-drying of sandarac solutions mixed with it.

A not unusual cause of unsuccessful experiments regarding the production of mat-varnishes might be ascribed to the changing of benzine for benzole.

The designation "benzole" for a distillation-product of the soft coal, and "benzine" for a distillation-product of petroleum is not generally observed; on the contrary, the benzole proper is oftentimes called benzine. It is therefore safest to designate the chemically totally different substances as coal-benzine and petroleum-benzine.*

The petroleum-benzine is not generally used for the production of mat-varnishes, and absolutely no mat-varnish will be obtained by employing petroleum-benzine in place of coal-benzine in the well-known mat-varnish formulas. But this does not exclude the possibility that mat-varnish may be produced from petroleum-benzine.

After a personal communication from Director Dr. Eder, who has experimented frequently with petroleum-benzine, the latter varies so much in its composition that the publication of a mat-varnish formula of petroleum-benzine might have very little success.

To avoid a changing of the two kinds of benzine the following method of distinction is to be recommended:

Pour into a test-glass a few cubic centimeters of the benzine in question, add a small crystal of iodine and shake.

The solution is now observed with regard to its coloration. If colored carmine-red by the iodine we have coal-benzine or benzole; a violet coloration points to petroleum-benzine.

In "Muspratt's Chemistry" this reaction is described as follows: "By shaking with an iodine crystal tar-benzine gives a violet, and petroleum-benzine a raspberry-red color."

My tests with different kinds of benzine corresponded always with the above-mentioned reaction, whereby petroleum-benzine was colored violet by iodine. An addition of alcohol or ether influences the reaction. Test-glasses rinsed with alcohol should not be employed, as the slightest trace of the same would change the violet coloration of the iodized petroleum-benzine to light-red.

It is not necessary to use the purest benzole for the production of mat-varnishes, toluol exercising no injurious influence. My tests in this respect taught me to add only toluol instead of benzole to the ethereal sandarac solutions used for the production of mat-varnish.

Toluol, as well as xylol, when shaken with an iodine crystal becomes red, with a touch of yellow coloration; the color reminds one of dissolved eosin.

PHOTOGRAPHY IN THE COLORS OF NATURE.

BY F. E. IVES.

(*Continued.*)

LANTERN slides made from the heliochromic negatives and exactly reversing their light and shade must also represent the effect of the object upon the respective color sensations. One lantern positive, when seen by transparency in red light, reproduces the effect of the object upon the primary red sensation. Another, viewed in the same manner by green light, reproduces the effect of the object upon the green sensation. The third, viewed by blue-violet light, reproduces the effect upon the blue sensation. Evidently, the combination of these three images into one must form a reproduction

* According to Hearen, *Dinghrs Journal* 221, 190, only the purest coal-benzine should be designated with the name of benzole, while the less pure article without constant boiling point would be called benzine.

of the object as seen by the eye, correct in form, color, and light and shade. Such a combination is effected by projecting the three pictures with a triple optical lantern, so that they exactly coincide upon the screen. The result is what we have been led to expect.

We have here a true solution of the problem of reproducing the colors of nature in a screen picture, dating from November, 1888. Previous to the publication of my new principle, it was assumed by Cros, Poirée and others that, if the projection method were employed, each picture should be projected by the same kind of rays as those which acted to produce it. In my method, as I have already stated, a picture made by the joint action of red, orange, yellow and yellow-green rays, but chiefly by orange, instead of being projected by a similar mixture of spectrum rays, is projected by red rays only. Similarly, the picture made by orange, yellow, green and green-blue rays is projected by green rays only, and that made by blue-green, blue and violet rays, by blue-violet rays only. That is the true principle, yet nothing of the kind had ever been suggested. The process is capable of giving results which are above criticism, except of that hair-splitting kind which applies also to the ordinary photographic process as a means of reproducing objects which have no color. The most serious objection to this method of solving the problem is that its only commercial value would lie in its application to the illustration of popular lectures.

Dr. Stolze, who was one of the first to recognize the genuineness of this solution of the problem, doubted if, even in theory, color prints from the same kind of negatives could be made to furnish such a perfect solution. A year ago, I also believed that there were theoretical difficulties in the way of realizing a perfect process with color prints. Only recently have I succeeded in showing what relation the colors of the prints must bear to the colors of light used in projection, in order to perform exactly the same function and, under like conditions of illumination, secure equally perfect fulfillment of theoretical requirements.

In the projecting method, we build up the luminous image by adding light to light. White light is produced by the mixture of the three colored lights used for projection, and black by their suppression. But when we carry out the process to produce permanent pictures, the paper which may form the basis of the picture is itself white, and it is the shadows that are built up by the superposition of color prints.

Nevertheless, the color print has exactly the same function to perform as the lantern positive—*i. e.*, to absorb and suppress, by its shading, light affecting one primary color sensation. If we remove our three positives from the lantern, the screen is evenly illuminated with white light. If we then replace the one representing the green sensation, its shadows will absorb the green light, with the result that the screen bears a picture in the complementary color, pink, on a white ground. In the color-print method, we commence with a white surface, which corresponds to the fully illuminated screen, and the shadows of the color print representing the green sensation, when laid upon this surface, absorb the same kind of rays as the shadows of the positive in the lantern, and with the same result, a pink monochrome picture on a white ground. Superposing the other two color prints upon the first one on paper is like inserting the other two positives in the lantern. This explains why the primary sensations are represented by prints having shades of the complementary (absorbing) color. It is the lights and not the shades of the color prints that represent the effect upon the respective primary color sensation. It is only necessary to use dyes that completely absorb red light, but neither green nor blue-violet for the print representing the red sensation, green but neither red nor blue-violet for the green sensation, blue-violet but neither red nor green for the blue sensation, in order to obtain from my negatives a color-print heliochrome that exactly fulfills all theoretical requirements, provided that it be examined in the same kind of white light that we obtain in the screen projections, by mixing red, green and blue-violet rays. The dyes mentioned by me in my paper of November 21, 1888 (Prussian blue, aniline magenta and aniline yellow), fulfill this requirement, and color-

print heliochromes made therewith according to my instructions must, therefore, reproduce all the colors of nature under the conditions of illumination just stated.

We have, then, a theoretically perfect and, at the same time, practicable process of reproducing all the colors of nature in permanent prints from three negatives.

In order to obtain colors that would appear of exactly the right kind and shade in ordinary white light, it would be necessary to use dyes, each of which completely absorbed all light affecting the color sensation which it represented, but no other. The colors would then be correct in ordinary white light, but would appear too dark relatively to the white ground. In order to obtain colors that appear brighter in ordinary white light, dyes may be used which completely absorb only rays that excite chiefly single primary sensations and other rays in due proportion. The dyes proposed by me also fulfill this requirement, so that even in ordinary white light the degradation of a color is insignificant, except in the greens, where it is noticeable.

I have seen some of the results produced by the older processes of composite heliochromy; and others who have also seen them will, I am sure, bear me out when I say that the colors have invariably been not only untrue, but either very dull or else flat and patchy and wanting in the delicate details and gradations of light and shade which characterize good monochrome photographs. All that showed bright colors resembled nothing so much as cheap chromos. In the composite heliochromes by my process, which I show to-night, the colors are, as you can see, as perfect in detail and gradation as the monochrome shades of an ordinary photograph.

According to Captain Abney, the pictures produced by the silver sub-chloride process are " photographs in natural colors." Those which I now show are not so in the same sense, but they are something more and better than that—they are photographs in the colors of nature.

I have already spoken of a class of writers who still believe in the ultimate success of the silver chloride process, or something like it. It is not very surprising that men imbued with such a belief should be displeased with the idea of composite heliochromy, which is something short of a miracle; but the worst of it is, that they will not even take the trouble to make themselves familiar with the subject, and almost every utterance they make in reference to it is calculated to mislead the public and discredit true progress. I do not know how many times such writers have assured the public that composite heliochromy was based upon the same principle as chromo-lithography, and was merely the production of colored pictures by the aid of photography. Even Dr. Eder, a most able photographic chemist, is reported to have assured the representative of a London newspaper that my process was " chromo-lithography, in which photography is only an accessory!" Now, there really is such a thing as photochromy, which is carried out on the same plan as chromo-lithography, but it is no more like composite heliochromy than the Morse system of telegraphy is like telephony. In photochromy, it is only necessary for the photographer to make one negative of the object to be reproduced, and this negative contains a register of form and light and shade only. Composite heliochromy cannot be carried out with less than three negatives, which must contain a register not only of form and light and shade, but of color also. In photochromy, an artist is employed to regulate the distribution of colors, according to his taste or judgment; in composite heliochromy, it is the light itself which regulates their distribution and combination, automatically, according to fixed and true scientific principles. Photochromy is an art; composite heliochromy, a science.

There are others who do make a distinction between photochromy and composite heliochromy, but whose statements are nevertheless too misleading to have any value. Only a few months ago there appeared in one of the oldest and most pretentious of the photographic journals, an editorial article upon this subject, in which reference was made to " the three primary colors, red, yellow and blue," and all advance made upon the basis of true theory was discredited. Another, writing for an important periodical, said: " the red, yellow and blue" theory worked well enough in practice, and classed

as an "advanced worker" one who had never got beyond that idea in composite heliochromy, or even contributed anything to its development. Dr. H. W. Vogel, taking advantage of the prevailing ignorance, even tried to make the readers of ANTHONY'S BULLETIN believe that I had claimed as my own something which belonged to him.*

The frequency of such misrepresentation by writers from whom the public has a right to expect something very different, is my justification for assuming the office of teacher and historian long enough to state the facts, which many people have wished to know, but could not discover by reference to current photographic literature.

In conclusion, for the benefit of those who would like to know why this process is not now in commercial operation, having been perfected in theory three years ago, I will say that, for various reasons, it is not practically available to one whose time is nearly all taken up with a business of a different character, and I do not expect to do much with it until I shall have completed preparations which will justify me in making it my chief occupation. In order to carry out the process in strict accordance with the theoretical requirements, means must be employed not only to secure three negatives and three prints, each of which is correct by itself, but each must bear also a certain definite relation to the others. A very little over or under-exposure of any one color print, or a very little too much or too little of the color stuff in the film, will change the shade of delicate colors. Fortunately, there is a simple optical test by which such a defect can be detected without reference to, or knowledge of, the colors of the object photographed; but at present it is difficult to secure such harmony of parts when but little time can be spared to devote to the operation of the process.

Composite heliochromy must always remain a comparatively costly process, when carried out in a manner calculated to yield the finest results, and can most profitably be brought before the public in the form of optical lantern lecture illustrations, not with the triple lantern, but with transparent color-print heliochromes mounted as lantern slides. If the color prints are made by the Woodburytype process, such heliochromic lantern slides, infinitely superior to hand-painted ones, can be made in quantity at a cost not exceeding one dollar each.

[*From the Photographic News.*]

NOTES ON PORTRAITURE.

BY H. P. ROBINSON.

No. I.

OF all the applications to which many branches of art have been put, that of portraiture is the most ancient, the most universal, and always has been the most popular. Indeed, it may be justly said that for portraiture art was invented. The persistence of its types is wonderful. According to tradition it began with a silhouette, and the same simple art is being revived by American photographers.

What was the origin of portraiture? The time-worn tradition tells us that its simple rudiments were due to the Greek maiden who traced the outlines of the shadow of her lover on the wall, that she might be reminded of him when he had gone to the wars—a pretty myth that ought to be true. This is said to have happened about 800 B.C.; yet this must have been a late date in the history of art, for Aristotle ascribes the invention to Euchir, who flourished about 400 years earlier. Other authors give the honor to other names, but all agree that its first appearance was among the Greeks, and that the earlier portraits represented the bare shadow, which was produced by circumscribing the figure with a single line only, and was the art they called *Sciagraphia.* Afterward shading was added to give the appearance of roundness; but, as a quaint old writer puts it, "The advantages it brought to its inventors were so inconsiderable

* Anthony's BULLETIN, 1889, p. 101.

that they still found it necessary to write under every individual piece the name of whatever it was designed to represent, lest otherwise the spectators should never be able of themselves to make the discovery."

The date I have mentioned as the time of the beginning of art, a little over three thousand years ago, seems a far-off time; yet art, and probably portraiture, was practiced, it is calculated, quite two hundred thousand years earlier. We have direct evidence of the portraiture of pre-historic man in the outlines of extinct animals engraved on mammoth ivory, and discovered in the drift.

We will skip a few thousand years, and come down to comparatively modern times.

Portraiture has always been the chief purpose of art, at least numerically. In England scarcely any other form of pictorial art was practiced until the last century, if we exclude the art of miniature-painting, of which we have such splendid examples in Missals and similar books. The English school can boast of the two greatest portraitists that ever lived, Holbein in the reign of Henry VIII, and Van Dyck in the time of Charles I. During the seventeeth and eighteenth centuries the number of portrait painters must have been enormous, yet the names of very few of them have come down to us. We can scarcely go into an old country house without finding a collection of portraits, usually all very bad, and so much alike according to date that you would suppose they represented the ideal of the painter rather than the individual. The conventionality of pose was, it is said, once carried to such an extent that when, in the time of heavy perukes, it was the fashion to carry the hat under the arm, if a sitter insisted on being represented with his hat on his head, he was painted with two hats, one on his head, the other under the arm; the painter would not give up his favorite pose. I have, however, never met with one of these double-hatted portraits. These family portraits are generally nameless as regards the painter, and, indeed, often doubtful as to the name of the person. There must have been a great number of itinerant portraitists going about the country in those days.

I happen to know one or two of these old country mansions or halls. As is often the case in these days of agricultural depression, the occupiers are not the owners, and take their ancestors on lease with the house and furniture, which is perhaps better than buying them in Wardour street. It affords more variety; you can get a fresh set of ancestors every time you change house. In the one I have now in my mind's eye the portraits are very good, beginning with the dark and sensual face of Charles II, who visited the place. There are many Lely's and Kneller's (what immense portrait manufactories these popular painters must have had), after which, as usual, they become anonymous. There is the usual handsome captain, time of Queen Anne, attitudinizing before the spectator; the dean in gown and bands, without whom no gentleman's family could be complete; the county squire; and the co-heiress twins.

In another house the portraits are nearly all of the last century, as though the family began and ended in that period. This, however, is not the case, for there are still successors in existence. Can it be that the portraiture of the first half of the present century was too bad to encourage or to keep? There were a few good portraitists, as we all know, seventy or eighty years ago—the successors of Gainsborough and Reynolds; but from examples one sometimes meets with, the ordinary oil portrait must have been very bad. We are told that when things come to their worst they mend. It is a fact that middle-class portraiture of the time was sometimes so bad that ordinary people, who could not afford to employ the fashionable painters, Lawrence, Raeburn, Romney, Opie or Shee, had, in despair, to have recourse to the humble silhouette. The popularity of this precursor of the photographic portrait for many years was marvelous. It was to be found in every home, both high and low, just as the photograph is now, but not, of course, to so great an extent. They began to be popular in the early years of the last century, and lasted up to the introduction of photography, and were never more popular than between 1830 and 1850. It is

darkest before the dawn. I believe it would be now still easier to find a silhouetter than a daguerreotypist.

It is a curious satire on fads, crazes and fashions in art, that even these black sticking-plaster portraits have been held up, if not as the highest art, as preferable to the work of the legitimate portrait painter, just as the "impression" of the present-time naturalistic is preached up by some latter-day enthusiasts as being superior to great art.

In 1780, a German follower of Lavater, as quoted by Mr. Tuer in the *English Illustrated Magazine*, wrote a volume in which he claimed the shadow portrait as a specimen of true art when compared with the "daub of the day" (the day of Reynolds, of Romney and of Raeburn !). "This art," he says, "is older than any other. In Arcadia itself silhouettes were drawn. The shepherds of that golden age, in their happy simplicity, traced shadows of their beloved on the sand—to worship in absence. From silhouettes came cartoons, then monochrome, and finally painting. The most perfect in the order of things displaces the less perfect. But now, again, since this new culture of physiognomy, silhouettes are asked for, since these give a truer idea than the daubs of the ignorant. The taste of man has revolted against affectation and returned to the simple." Silhouettes gave rise to the invention of the profile machine, a rod working on a pivot or universal joint. The long arm was passed over the profile while the pencil in the short arm marked the likeness. Photographers are not, then, the first to take portraits by machinery, and the profile-machinists were patronized by royalty—or said they were—like some photographers.

We are in the habit of considering and talking of the enormous number of photographic portraits produced each year, and photographers have a right to boast of their output, if not of their quality; but the portrait painters, also, must have been most productive—in some cases, indeed, beyond belief.

Michael Jansen Mirevelt, a contemporary of Rembrandt, is credited with having painted the largest number of portraits. Besides a number of altar-pieces, he is estimated by Descamps to have painted 10,000 portraits; this prodigious number is, however, limited by Houbraken to 5,000. Taking the lesser number, and giving him forty years' work, he must have averaged over two heads a day, which, as Euclid says, is absurd. As he seldom painted a portrait of a less size than 30 x 20, his hands must have been full. Lely and Kneller had wholesale businesses; but the great painters of the latter half of the last century—Reynolds and Gainsborough—numerous as their productions appear to us, could have counted their pictures by hundreds only.

I remember several itinerant painters who visited country towns before the advent of photography—or, rather, before it became available for portraiture. They usually began by taking a portrait of the beadle in his gorgeous livery; everybody knew the beadle, and this was a capital advertisement, which never failed to bring in sitters. Photography has altered all that. The itinerant has vanished, and English portrait painting has resumed its former glories. Who shall say that this revival is not due, in some measure, to the impetus given by our more humble art?

[*From the British Journal of Photography.*]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

CHAPTER X.—TREATMENT OF THE NECK, HANDS, DRAPERY, ETC.

It is not in every negative that the neck requires the assistance of the retoucher to make it acceptable. Gentlemen's heads seldom require very exhaustive treatment, although some will give a great deal of trouble at times before we have secured a satisfactory effect. In considering the neck, the line of shadow which may be said to form

the outline of the lower jaw will be the first portion to demand our consideration. There is very much more expression and feeling in this shadow than will appear at the first glance. Whenever it may be but feebly defined, care must be taken not to further lessen it, but rather, by working upon the adjacent or surrounding parts, bestow upon it more distinctness of form. There are many cases in which the operator, no matter how skillful and thoughtful he is, may be unable to secure sufficient shade to do justice to his sitter except at the price of offensive shadow in some other parts of his picture. If, for example, the brows of the subject under treatment be very heavy, and, as is usual in such cases, throw the eyes into deep shade, the operator is obliged to relieve this natural defect by reflected lights whenever he cannot do so by direct lighting. Needless to say, this remedy must affect the outline of the lower jaw, even should the same be strongly marked, and how much more so must this be observable when it is more weakly defined ! Under these and such conditions it must be our task to recover as much of the lost shadow and vigor as possible, and as is really necessary to the proper balance of the face.

In many gentlemen's portraits care must be bestowed on the throat as well as this line of the jaw, many of the markings in this locality being absolutely characteristic, and ofttimes possessing a great deal of the individuality of the sitter. They must only be modified, as their entire leveling away would be most ruinous. In retouching the neck of even the ordinary subject, as in all other portions of the face, roundness and softness should be the main qualities which we should ever struggle to secure.

The high lights must never be brought to the edge of the hair or whiskers and beard but a gradual approach made toward these portions of more or less shadow by the preservation of all the half tone left in the negative by the operator. As I said before, but little, as a rule, is required in this direction when our sitters are gentlemen, except where these defects of light may be the cause of such exaggerated shadows as will assuredly appear offensive to the eye.

In men's portraits, as a rule, the larynx will be found to throw too deep a shadow; this should be softened, as also such muscles as are too obviously demonstrated. In all these parts the various lights should in no cases be touched or strengthened, for such a treatment would only tend to bring the throat forward and thus falsify its natural position. If very abrupt or unseemly shadows should occur in the beard, whiskers, or moustache of any subject, they should be so touched as to be rendered less striking, and in more harmony with the surrounding parts. This may be accomplished by one or two judicious strokes of a soft, blunt pencil. With these remarks we can leave the male portraits with safety, and turn our entire attention to those of the ladies, which will give us considerably more trouble.

Ladies in court or evening dresses, with more or less low-necked bodices, often afford us a very large amount of trouble. All the markings, such as the shadows showing the formation of the various bones and muscles in the neck, and the shadows thrown by same, must be very carefully removed. By this must not be understood to recklessly work away and produce light where shade before existed, but simply to secure an even and subdued half tone which will be in harmony with lighting of the head generally. The general tone of the neck should be always lower than that of the face in order to thoroughly preserve their relative positions. Indeed, it may be accepted, too, that ladies will never take exception to their necks and shoulders being rounded off and softened to the utmost extent that an artist's flattering pencil can accomplish.

The hands and arms in ladies' portraits, when they are shown, will also require to be worked upon in order to subdue the markings produced by the veins, which invariably appear much more prominent under the influence of studio lighting than they ever do in nature. In many cases these markings would, if left untouched, be absolutely offensive to the eye, as well as untrue to nature; for they would be scarcely, if at all, visible in nature, while in the plain photograph they might be most strongly depicted. The creases on the knuckles and dimples on the back of the hand may

often require considerable softening, as they are generally greatly exaggerated, if not altogether out of all balance with the general tone of the rest of the hand. This result may not always be traceable to the lighting, but may be greatly influenced by the natural color of the hand.

It is one of the primary rules in portraiture to give the greatest prominence to the face, therefore the hands should, when possible, be kept in a subdued and delicate half tone. This should be observed still more strictly in cases where the hands are not so very small or well posed.

In painting, the hand is accounted one of the most important points in the picture, and often tests to the highest the artist's skill to produce it satisfactorily. It is astounding, therefore, that many photographers should think rather lightly of it, and in many cases bestow but very scant attention upon it. It is also very seldom that retouchers make even a passing study of the hand, and those who do make but a slight study of it generally dispose of it in a slovenly or careless manner, by which it is not at all improved, but in many instances rendered more defective and unsightly than it was originally. To those who wish to become perfect, however, I can promise that the most complete satisfaction will repay them for bestowing the most elaborate accuracy in its treatment. That such careful work as is really needed would pay commercially is not the point we have before us, but rather to consider what should be done in order to produce the best work and how to do it.

It may appear strange, but it is none the less true, but on the contrary is a very significant fact, that the best photographers—those who have gained a world-wide reputation as men of skill and judgment—have always bestowed as much attention and care on those points as to the rest of a picture. Hands and arms should always be so arranged in a portrait picture that they would not arrest the spectator's attention ; in other words, they should always be subdued in tone and treatment, but they should never fail to receive their proper share of care and attention all the same.

Skillfully disposed, the hands and arms may form a very powerful auxiliary in the expression of pose. Indeed, lighted and retouched in such a manner as to give them the appearance of being easy, probable and fleshy (not as though they were cut out of white paper), they will form a very essential part of the study of ladies' portraiture, adding to the picture by their beauty of proportion and graceful display of outline. It must be remembered that the left hand takes a more graceful bend at the wrist than the right one, but the license of art allows us to import (if possible) to the latter the superior grace and beauty belonging naturally to the left. As for the markings on the fingers, they will speak for themselves in each negative.

Should the pose of the arm produce a sharp angle at the elbow-joint, the same may be rounded off with considerable advantage to the picture. This should either be penciled or cut away upon the film, as the negative may best lend itself. Sometimes the wrist-bone may protrude and spoil its general appearance ; this, too, should be removed with similar care and judgment.

The hair is generally all right, but there are times when it may be worked upon with very considerable advantage. The lights and shades when too abrupt should be so worked upon as to blend them together. To effect this purpose, a soft and blunt pencil will prove the most satisfactory. Very great care should be taken when retouching the face not to carry the work right up to the edge of the hair, as by so doing a harsh, hard line may be formed which would ruin the appearance of the entire picture. It should ever be our desire to secure roundness and softness, and this can only be done by the combinations of soft outlines, and brilliant centers, but never by violent contrasts.

In cases where the hair requires lightening in tone (photography rendering some shades of hair more darkly than others, and altogether contrary to what they appear in nature), have the negative mat varnished, and then either put a little ivory black or plumbago on the back of the negative and on such portions as you desire to come

lighter in the prints. The lead resulting from the sharpening of the pencil on a pad may be applied with a stump on the mat varnish, and will be found the most efficacious means at our disposal for lightening any such portions of our negative as may appear to us to print too heavily or black. I have known negatives that, in their natural state, would render the faces positively black in the ordinary course of printing, which, by a judicious application of this plumbago upon the mat varnish, have been rendered capable of yielding very decent prints indeed. If the hair of any intended sitter be such as will photograph too darkly, a very satisfactory effect may be gained by powdering it at the time of sitting. Broad lights in the face may also be put in by this stumping on the mat varnish on the reverse side of the negative. By this means very often negatives which would produce prints very flat and altogether unpresentable pictures may be rendered capable of producing very passable results indeed.

The drapery, except when of very glossy and thin silk (which usually presents such a broken appearance as to almost defy further manipulation), may be greatly helped by a few judicious applications of the pencil. Light materials—such as drab, blue and white—may, by the least manipulation possible, be made to look so brilliant, and to contain so much delicacy of half tone and detail, that the retoucher will be fully repaid by the result for whatever time he may have expended upon the working up of these portions of his negatives. In most cases all these lights are indicated in the negative, although not with sufficient strength to print. Such lights, therefore (especially in the larger size negatives), should be intensified by a few sharp and decisive touches applied to the back of the negative—already mat varnished—with a stump and plumbago. A knowledge of drawing will naturally be of considerable assistance in an endeavor to force up the details of any defective negative upon which we have to exercise our skill.

When the negative is prepared by the application of the medium and ready for retouching, a great number of these lights may be put in on the film side of the plate, using for the purpose a fine cork or molded gray paper stump. Most lines running across the waist of a dress from right to left, such as creases in the bodice, etc., should be taken away, as they only spoil the shape of the dress, and thus cause the sitter to find fault with the otherwise acceptable picture. A few touches skillfully put upon lace will greatly enhance its value, and many such touches are best placed on the back of the negative by a soft pencil or a white crayon on the mat varnish.

These remarks will be found, in practice, to apply to all and every "method" of retouching that may be adopted by a beginner, as in each of them the same ultimate result is sought after, and the same principles of art employed.

[*From Photographic Scraps.*]

INFLUENCE OF EXPOSURE AND DEVELOPMENT ON THE TRUE RENDERING OF COLORS.

PERHAPS at no period in the history of photography has the subject which heads these remarks occupied men's minds and exercised their ingenuity more than at present, when, gelatino-bromide processes having attained to such perfection in point of rapidity, their enlarged capacities as compared with collodion processes enable things to be attempted which the old workers would have considered impossible. Time was when the only sensitive salt of silver used on plates was the iodide, comparatively speaking, a very slow compound, and sensitive only to the violet and blue rays, unless a very prolonged exposure was given, which ended in solarization. But the introduction of silver bromide, which can be made sensitive to the green, yellow, and even the red rays of the spectrum, brought about not only a greater general sensitiveness, which we call rapidity, but also a sensitiveness to those colors which photography had hitherto failed to render, especially green.

First, it may not be out of place to consider what is the true rendering of color,

by which, of course, is meant the translation or conversion of various colors into the monochrome of a photographic print through the medium of a negative. Let me ask a question. If we photograph a landscape in summer, and if we tone our print to a black and white so as to assimilate it to the characteristics of a woodcut or engraving, how will our print accord with a woodcut or engraving of the same subject? If we consider that in our landscape there will be red, orange, yellow, green, blue, indigo and violet visible to the eye, as well as black (deep shadows) and white (sky, etc.), to say nothing of the host of intermediate shades and *nuances* of a nondescript order, it will at once be seen that, as many of these colors possess visual intensities out of all proportion to their chemical activity on our dry plates, a photograph is unlikely to render the subject in the same manner that an artist would, who with pencil or monochrome brush, might simultaneously be delineating the identical landscape. This is admittedly one of the great drawbacks of photography, and which hitherto has been held as a reproach by those who love to find fault with our art; but they forget that in all probability their own method or techinal style of depicting on white paper with black lines, dots, or washes, objects containing colors, is after all a mere conventional manner, which has grown to what it is by reason of our eyes being trained to comprehend what we see in monochrome pictures, whereby we understand what the objects are which are so depicted, notwithstanding the absence of coloring, form and shape oftentimes atoning for lack of color. The question I have asked above I must leave my readers to answer for themselves. Suffice it to say that the limited space at my disposal in *Scraps* forbids my following this branch of the subject any further here, and I must at once address myself to the more urgent question—the chemical—of how to approach truth in rendering colors by the means at our present disposal, *i. e.*, a highly sensitive gelatine plate.

I have already alluded to the relative sensitiveness of two of the haloid salts of silver, the iodide and the bromide, and I might also have included chloride; however, as this is a topic which concerns mostly the emulsion chemist, it will be needless here to allude to these further than to explain that although a given plate may contain all three salts locked up in the gelatine, the color-sensitiveness of that plate may be totally at variance compared with another make of plates. Sufficient is known by the non-technical users of plates that a very slight impact of light will generally act upon nearly any gelatino-bromide plate; they also know that the sky and high lights are usually developed, even when nothing else can be got out, and they know, too, that a too prolonged exposure will make their picture rush up under the developer, and probably fog. But the causes which operate in these various results have not been entertaining study to the bulk of photographers, who have left the subject pretty much in the hands of *savants* and dry-plate manufacturers, until at a recent date the controversy has begun to assume more importance and a wider recognition from a large number of those who are to-day interested in raising the status of the art-science.

Some ten years ago Eder published a small book (subsequently translated by Abney) entitled "The Chemical Effect of the Spectrum" (Harrison, Pall Mall, 2s.), which is well worth careful perusal by all who wish to know what is the action of light upon the sensitive surfaces used in photography. True, the experiments were made with, and the first thirty pages of the book related to, collodion as a vehicle for the sensitive salts of silver; but nevertheless, the general principles and conclusions arrived at by the author may be accepted as holding good as regards gelatine, in so far as concerns the behavior of gelatino-bromide plates when submitted to the rays of the spectrum.

Gelatine of commercial manufacture may be stated roughly to be sensitive to the rays of the spectrum, beginning with the blue, indigo, violet, less to the green, and still less to the yellow, orange and red, unless prolonged exposure be given. Now, if we expose a plate for a very brief period (known as under-exposure), on development we get merely the high lights, or such as reflect blue rays; by giving more exposure we get evidences that the green rays have affected our plate, and if we still longer prolong

our exposure we get effect from the yellow; but by this time, generally, over-exposure begins to show itself, and here steps in one of the great drawbacks of our modern photography, viz., the difficulty of making plates sensitive to the rays near the red end of the spectrum without involving troubles of a counterbalancing importance.

Space forbids the detailed consideration of a large number of experiments which I have recently made in pursuance of this interesting subject, in which the spectroscope has played a very important part, the object being to ascertain some of the conditions necessary to the attainment of the title of my paper. Considerable sensation, even amounting to consternation, has been caused in scientific circles by the publication of Hurter and Driffield's "Photo-Chemical Investigations." With many of their conclusions I may humbly be allowed to differ, but am chiefly concerned at the moment with one which bears on the subject in hand.

They assert that "the only control the photographer has over development lies in securing a greater or less density of image, and that he has no control whatever over the gradations of the negative." Now common sense, and the practical experience of every-day work, utterly refute such a theory, as any photographer who has more than a few weeks' experience will testify.

Well, I will leave these gentlemen alone while I will throw out a hint or two on the subject at present occupying our attention. I am one of those old-fashioned photographers who not only believe in relative value of exposures, but I attach a very great importance to the judicious use of stops or diaphragms in lenses, which bears upon the character of the image quite as much as concerns definition, or the covering power of the lens. If I am about to take an instantaneous picture I naturally employ as large an aperture as the lens will permit, consistent with adequate definition; but if I am about to photograph a vase of flowers I unhesitatingly put the smallest stop in my lens. By this proceeding I consider that by reducing the whole of the light in the camera I am enabled to give a long exposure, which gives the rays of lesser refrangibility a chance, without much fear of solarization of the high lights. All my experience and experiments confirm my belief that this is one of the methods well calculated to obtain an approach to correct rendering of color graduation. I have access to a good conservatory where I have just photographed some flowers, and have succeeded in getting a yellow azalea very well, and that very difficult flower, the narcissus, by twenty seconds' exposure with f–28 on a "rapid" plate. There is every indication that matters would have been improved by even a longer exposure and smaller stop. To arrive at exposures under such conditions and requirements, calculate what the stop in question would require; if it is twenty seconds, then simply double it and give forty seconds, and I have no doubt no harm will be done by over-exposure, where color has to be estimated for.

Then as to development (Messrs. Hurter and Driffield notwithstanding), I have a firm belief in my ability, by a judicious use of the components of the developer, especially of the ammonia, to help out the difficult bits—the greens and yellows. I should always keep the bromized pyro low under such circumstances, and use ample ammonia to the fullest extent of safety. A small stop cuts off the intensity of the light from the blue end of the spectrum, and, combined with a long exposure, gives the reds and yellows time and opportunities of acting on the plate before the blues are greatly over-exposed.

I caution beginners that this rapid development is rather a risky process with which it would be best to experiment before trying serious work. I would also advise great care in the matter of development light; in all attempts to photograph colors the plates ought never to be manipulated in any but a dark-red light—deep ruby.

TECHNIQUE.

THE "old reliable," the BULLETIN—I have taken it ever since it commenced. I never expect to go back on it until I cross over Jordan. J. A. PALMER.

OBITUARY.

JOHN A. WHIPPLE.

On April 11th, there passed away another of the veterans of American photography, John A. Whipple, of Boston. He was for many years a member of the firm of Whipple & Black, and invented a special kind of photograph called "crystalotype," being the first of the kind produced upon paper. He was an early user of the collodion process and among the first to take pictures of the moon, which he made at Harvard Observatory. He also made pictures of an eclipse, at the University of Tennessee. In 1874 he retired from photographic work. He was sixty-eight years old when he died, and leaves a widow and five children to mourn his loss.

Mr. Whipple was noted for his experimental work in the early days of photography. It is said that when a boy and hearing of the discovery of Daguerre he made a camera out of a candle-box and attempted to produce a picture on a silver spoon for a plate. His early work in making photographic chemicals is well known to the older members of the fraternity. His success was largely due to his love of chemistry and optics, and he was probably the first to make pictures from the microscope on the daguerreotype plate which he accomplished as early as 1846. As a man he had many friends and his life work was a valuable contribution to the art as well as the science of photography.

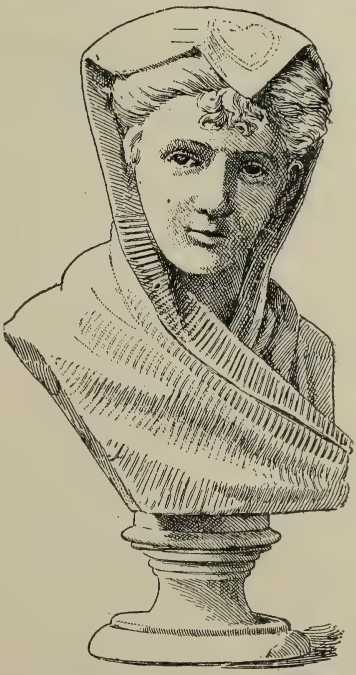
OUR ILLUSTRATION.

Some time ago we had the pleasure of a call from Mr. Theodore Brinkmeier, who brought in some of his photographic work for our inspection. In a large collection of pictures we noted a number that we thought would make interesting and instructive illustrations for the Bulletin. All the pictures were stamped with true artistic feeling, and the example that we give with this issue of the journal is a good specimen of the work. One of the most interesting things about this work of Mr. Brinkmeier is that it is made with a cheap photographic outfit, illustrating the perfection of such apparatus, and also that it takes brains to use it. It requires something more than "you push the button."

Astronomical Congress of Paris.—The important work of executing the chart of the heavens is progressing. A new International Astronomical Congress has just met in Paris, with the view of making final arrangements. Moreover, all the preparations are complete, and in three months from the present, work will have commenced in all observatories. It is proposed to photograph something like forty millions of stars, and one may judge, by this figure, of the extent of an enterprise which promises to be the greatest achievement of the science of photography. Captain Abney, prevented by indisposition from attending the first meeting, was able to assist at this second session. We do not know exactly what has been decided as to the nature of the sensitive plates; but it seems to us that the orthochromatic plate, sensitive to red, offers itself as capable of producing the best results.—*Photographic News*.

PRIZES FOR THE BUFFALO CONVENTION.

THE cut below is but a very feeble portrayal of the beautiful bronze group to be given as the grand prize at the coming exhibition at Buffalo, held under the auspices of the Photographers' Association of America, for the three photographs which best illustrate Tennyson's beautiful poem, "Elaine." There is a very decorative marble pedestal about 3½ feet high on which the bronze rests, making it a particularly attractive ornament for any home or studio. Is it not worth an effort on your part to try and win it? Will not that effort, even if not successful in winning the prize, be an incentive in stirring up your latent talent so that a more artistic and poetical feeling will be observed in your productions? Are not the photographs you will make well worth your labors as specimens for your studio, showing your customers your ambition to excel, thereby winning their confidence? Put off the feeling that it is of no use to try, as some one else



will surely win the prize, but go into it body and soul, and you may far excel the confidence you have in your own abilities.

The Carrara marble bust is for the prize in the genre class. The head is nicely modeled and cut, and is an exquisite art production. The same remarks as to striving for the prize will apply to this class as mentioned for the grand prize.

The medals are to be struck from an entirely new design, and one which the Executive Committee feel confident will be admired by all.

Let all strive to secure one or more of the different prizes. I am sure you will feel well repaid for the study and work spent in trying.

Application blanks for space can be secured by writing to S. L. Stein, 310 State street, Milwaukee, Wis., or W. A. Davis, 872 Broadway, New York. GEORGE H. HASTINGS, *President P. A. of A.*

[*From Journal of the Photographic Society of India.*]

PRESERVATION OF EIKONOGEN.

BY COLONEL J. WATERHOUSE, B.S.C., *Assistant Surveyor-General of India.*

PROFESSOR W. K. BURTON'S paper on this subject is most interesting and valuable, especially as he appears to have found a satisfactory solution of a problem on which I have been working more or less intermittently for some time past. I have not yet tried the method he recommends for washing the eikonogen crystals, and then preserving them in a 12 per cent. solution of sodium sulphite, but from my experience in the same direction, I have no doubt that it will answer well; the sulphite, however, must be good and not alkaline. From recent notices in the European journals, it appears that the German manufacturers of eikonogen have succeeded in making a product that does not darken with heat and moisture, and it is said that this is brought about by the addition of a bisulphite. The new product is a white powder, and is most probably thoroughly desiccated, so as to drive off the water of crystallization to which is in great part attributable the darkening of the eikonogen crystals. In dry air at a low temperature they keep well, but in moist air at a high temperature, as is the case here and in most tropical countries, they rapidly oxidize, darken and decompose. Some eikonogen of English manufacture lately received is in salmon or pink-granite colored crystals, and so far it shows no sign of discoloring, but whether it will stand the quickly approaching hot weather remains to be seen.

Although Professor Burton has succeeded with the treatment with alcohol I suggested in a former number of the *Journal*, I find that it does not answer so well as I expected it would. Some crystals that had been cleaned with an acid solution of sodium sulphite, much in the same way as recommended by Professor Burton, remained white for a very long time in spirit of wine: but some fresh crystals put into absolute alcohol did not keep nearly so well, and the alcohol has extracted a good deal of a yellow substance. As Professor Burton remarks, in order to get the benefit of the treatment with alcohol, the spirit must be changed two or three times, as it draws out and becomes weakened by the water of crystallization from the crystals. Precipitation of the eikonogen by acids has also been recommended as a means of keeping it in good order. I have tried several acids in a cursory way without quite satisfactory results. Phosphoric acid seemed to have a powerful action in keeping the solution free from darkening. Eikonogen is such a valuable developer and so pleasant to work with that so satisfactory and simple a means of keeping it in good order in tropical climates as that recommended by Professor Burton is very welcome.

It may be noted, with reference to the use of the dark-colored washings of the eikonogen crystals as an ink, that, although it does make an admirable writing fluid, it is so easily washed off the paper that it is quite unsuitable for use as an ink to be used for any permanent records.

PHOTOGRAPHY IN RUSSIA.—Though the Photographic Exhibition now being held in St. Petersburg is confined to the Russian Empire. the best exhibits, writes the *Daily News* correspondent, are of English goods. This is notably the case with cameras and apparatus. One interesting exhibit is a large series of views taken by the brothers Groum Greshemailo in their recent journey in the Thian Shan and in Chinese Turkestan, and alongside is the camera by which they were taken, and it is of London manufacture. As for the views, enlargements, and transparencies, they are fully up to the standard of such exhibits in England.—*Photographic News.*

IT is pleasant to be appreciated, and we feel a pardonable pride in quoting from the *Connecticut Guardsman* the following: The BULLETIN comes to us as an old standby, a sort of photographic sheet anchor, always good and ever welcome. With such eminent chemists and physicists on its editorial staff it is but natural that we should expect great things and we are not disappointed. By its enterprise and energy notice of many of the new discoveries in photographic science have first reached American eyes through its columns. Notably the new acid fixing bath now so largely used was first described in the BULLETIN.

ANTHONY'S
Photographic Bulletin.
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Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.
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E. & H. T. ANTHONY & CO., Publishers.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE regular meeting of this Section was held Tuesday evening, April 7th. *President* H. J. NEWTON called for order at 8.15. The Secretary reported the receipt of various publications, circulars and letters. He also announced that the committee on cataloguing were busy at work, and hoped shortly to lay an entire scheme before the Section. At the next meeting, May 5th, Mr. Charles Hull will exhibit a series of lantern slides.

The evening's entertainment was supplied by Mr. Cornelius Van Brunt, who brought along a large number of slides, made by Ferrier about thirty years ago. These were mostly stereoscopic slides, being made at a time when lantern-slides were a rarity and the stereoscope a familiar object. When these slides were imported by E. and H. T. Anthony & Co., efforts were made to produce similar results by workers in this country, and Mr. Van Brunt's collection included a number made by the veteran, T. C. Roche. Lastly were shown some slides on gelatine plates made by Mr. Van Brunt himself. Although introduced with much modesty by the author of their being, they were of the finest quality and worthy to rank with the work of Ferrier and Roche.

Ferrier's slides included views all through Europe. Panoramic views of Paris, bits from the Louvre, Louis XIV's bedchamber at Versailles, Edinburgh, Melrose Abbey, Athens, Constantinople, Egyptian temples, Seville and its Moorish architecture, the Temple of Jupiter Serapis, with its columns showing evidence of submergence and upheaval, Naples, Florence, Milan, Piza, Rome, all were visited. Perhaps the finest of the set were a series of Alpine views. These were simply marvelous.

Mr. Roche's work included views on the Hudson, of Niagara, the old Church of the Puritans, once in Union Square, gone now to make room for Tiffany's; views in Central Park, and others, all taken about the year 1862.

Mr. Roche said things then were not so easy for the photographer. A small wagon accompanied the operator, and the pictures were finished on the spot.

Mr. Van Brunt then exhibited a series of slides made by himself, these calling forth rounds of applause from a deeply interested audience. During the exhibition of the slides, he interspersed a chatty description, making the meeting probably the most enjoyable and instructive yet held by the section.

Mr. Mason thought that the albumen process was too much neglected, and thought it would be a good plan for some of those present to make their lantern-slides on albumen plates.

Mr. Newton did not believe in "Looking Backward." Those who desired to work the albumen process, could no doubt get the details from Mr. Roche. He proposed that, at the June meeting, a thorough comparison should be made between lantern-slides made by the gentlemen present and by Ferrier, Levy and the older workers. Each should make some twenty slides by his own pet process, make them as well as possible, and bring them at the June meeting for comparison with the albumen slides.

Mr. Roche said that the great advantage of the albumen slides lay in the fact that they were practically grainless.

The meeting having thanked Mr. A. D. Fisk for officiating at the lantern, adjourned at 10.15.

BROOKLYN INSTITUTE—PHOTOGRAPHIC DEPARTMENT.

AT the regular monthly meeting of this department, held Tuesday, April 14th, Mr.

J. Wells Champney delivered a lecture upon "Selection in Photography." The lecturer illustrated his remarks by chalk sketches upon green paper, and fully demonstrated his capabitity to deal with so all-important a subject.

Referring to the differences of opinion which existed as to what really constituted art, he thought that the motto of the worker should be selection and rejection rather than composition. The whole picture should be finished delightfully, not equally, avoiding as much as possible having two objects of the same height and length in one and the same picture.

The marvelous manner in which the lecturer sketched on paper his ideas of true harmony brought forth repeated applause from the audience, who from the first were all attention, and evidently highly pleased and interested in the treat provided for them.

At the close a series of lantern slides were shown on the screen to further demonstrate to the uninitiated what to aim for. These were very much appreciated, and the band of aspiring photographers departed, having listened to the most instructive lecture delivered before the section this season.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

The annual general meeting of this society was held on Tuesday, April 14th, in their rooms at 113 West 38th street.

In accordance with the rules of the society the roll of members was called, after which the minutes of the last meeting were read and approved.

On motion, the report of officers was held over until the scientific business had been concluded. Mr. W. M. Murray read a paper on "Lantern Slides." For this work he was eminently fitted, for in addition to being an expert slide-maker, Mr. Murray has officiated repeatedly as critic on slide nights. Special reference was made to the coloring of lantern slides. A vote of thanks was awarded Mr. Murray for his instructive papers.

Mr. A. Peebles Smith demonstrated his Graviotype paper. Paper is coated with a very thin emulsion containing salts of silver, iron and platinum. This is printed until the outlines of the picture are dimly visible. The time of printing is about one-fourth that required for albumenized paper. The picture is brought out by cold development, and fixing ensured by immersion in muriatic acid and finally in water.

Mr. F. C. Beach exhibited a dry developer, Phainogen. Also a shutter made by Prosch, the peculiarity being that by means of a center slit, it is claimed that more exposure is given to the sides than to the center of a plate. Watkins's exposure meter was exhibited and described by the same gentleman. In this instrument four considerations are taken into account and provided for: actinic force of the light, sensitiveness of the plate, color of the subject and the diaphragm used.

Mr. D. H. Walker had used a photometer of somewhat similar construction, and had always found it reliable.

Miss C. Weed Barnes thought that anything tending toward the saving of material was well worth investigation, especially when one was working with large plates.

This concluded the scientific business and the meeting proceeded to the election of officers for the ensuing year. The recommendations of the nominating committee were carried throughout, the list reading: President, J. H. Stebbins, Jr.; Vice-President, R. A. B. Dayton; Recording Secretary, T. J. Burton; Corresponding Secretary, F. C. Beech; Treasurer, C. C. Roumage; Directors, F. Vilmar, E. Warrin, F. C. Elgar, D. H. Walker, R. L. Bracklow, L. B. Schram, H. N. Tieman and H. S. Mack.

ST. LOUIS CAMERA CLUB.

The annual meeting of the St. Louis Camera Club on April 7th, at the club house, was attended by more than thirty members. After hearing the annual report of the officers the club proceeded to elect the following officers: John B. Holman, President; John W. Dunn, Vice-President; William M. Butler, Secretary and Treasurer; H. B. Alexander, Chairman of Lantern Slide Committee; C. M. Alexander, Chairman of the Membership Committee; Julian Laughlin, Chairman of House Committee.

Messrs. Collins, C. M. Alexander and Houston were appointed to make the arrangements for the annual-field day in May, an occasion looked forward to very eagerly by all the members of the club. The club then adjourned, and the lantern slides of the Buffalo (N. Y.) and San Francisco Camera Clubs were shown to the members. Some of the cloud effects were especially fine. Among these were several views of the famous Lick Observatory in winter, and from the summit of Mount Hamilton above.

Among the Buffalo slides were a set of English views of Haldon Hall, on the River Cam,

etc., which were fully equal to anything yet seen here.

The club has completed its arrangements to occupy its new commodious quarters in the Pastime Athletic Club building, beginning on July 1, 1891. The election was unusually harmonious, all the candidates having been unanimously chosen.

BROOKLYN ACADEMY OF PHOTOGRAPHY.

The Brooklyn Academy of Photography held its thirtieth exhibition of lantern views on April 15th, in the Hoagland Laboratory. Among the most interesting views were about sixty pictures of the Navy Yard. In connection with these a paper was read by Dr. J. H. Raymond, giving the whole history of the Navy Yard. Views of the old Remsen House, the Jersey Prison Ship, the sloop of war *Brooklyn* and portraits of several famous old captains were exhibited. Among the modern views were the ordnance docks, the Navy Hospital and a series of pictures entitled, "A Trip Through the Navy Yard." Fifteen views connected with the launching of the *Maine* and a picture of Secretary Tracy were also exhibited. Among the contributors of views were H. Allen Smith, who contributed forty-five slides of the Navy Yard and prepared the paper read by Dr. J. H. Raymond; Frederick M. Lawrence, Henry S. Fowler, J. M. Croll, William Arnold, Dr. W. H. Titus, H. Tremper, Frank B. Jackson and Dr. Stewart Church.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—A. A. G. writes: I would like to know some method by which I can transfer pictures to china plates? Will you let me know the best and easiest way to do it?

A.—What you ask for is not to be given by a short description in these columns. The making of photo ceramics is quite a delicate process and requires more skill in handling a small furnace to burn-in the pictures than any great knowledge of photographic processes. There is no good method of working given in English books, but the little French volume called "Traite Pratique de Photographie Decorative," by V. Roux, gives some excellent working formulas, which appear quite to the point in the way of practicability. We are sorry that they are too long to reproduce in these columns. The above book can be obtained through any importing bookseller from Gauthier-Villars, 55 Quai des Grands-Augustins, Paris.

Q.—H. S. Jr., writes: I wish to prepare some tables of approximate exposures, for plates of varying rapidity, for my own use. I wish to base them upon Mr. Burton's table of comparative exposures. What would be the approximate sensitometer number of the plates, for which Mr. Burton's table was probably computed? What is the usual percentage of time to be deducted for each higher number of plate, say beginning at No. 18 and ending at No. 26? Would the difference in time of exposure between plates ranging from No. 18 to No. 26 be uniform from number to number?

A.—Professor Burton states in his description of the method of using the tables "The rapidest plates of which we have had any experience will not be spoiled by exposure of half those given, whilst the slowest commercial plates sold as 'rapid' or 'instantaneous' will not require more than twice those given." From this we are led to believe that his slow plates were about sixteen on the Warnerke sensitometer while the quick plates were probably about twenty-four. The ratio between the numbers is uniform and a simple proportion should give the necessary ratios for higher figures.

Q.—C. A. B. writes: Please give in the next issue of the BULLETIN a formula for making a sensitizing bath for preparing a zinc plate for etching.

A.—It is not possible to give in the limited space of these columns the necessary directions for zinc etching. We must refer you to the article of Dr. Miller in the "International Annual" for the year 1888, page 377, where will be found all the details of the process.

Q.—C. F. B. writes; I enclose a print to see if you can tell me the cause of the black spots on it, and the reason of the yellow color which comes out after toning?

A.—The spots are probably due to dust on your printing bath or on the paper before it is floated. To clean the bath draw over its surface a clean piece of blotting paper before you float the paper and carefully rub the surface of the paper itself, with a piece of clean cotton. The color of the prints is due to imperfect toning or a weak toning bath.

Q.—B. and M. write: We are much

troubled with black metallic specks appearing in our silver prints; we have tried all brands of paper and see little difference. They invariably appear during the first washing before toning, and sometimes the prints are nearly covered with them. We enclose a sample, but not a very bad one. We thought at first it had something to do with the iron pipes, through which the water comes (we pump from a well into a cistern), but we do not now think it can be that. Would you kindly give us your opinion in the BULLETIN? We may add that the water does not stand in iron pipes.

A.—From a careful examination of the specks, we are inclined to believe that the cause is to be found in the water. They appear to be minute accumulations of woody matter around which the silver has become reduced. It may be necessary to filter the water to get rid of them. We should like to see some of the bad specimens of the same trouble and then we may be able to help you better.

Views Caught with the Drop Shutter.

N. C. THAYER & Co. of Chicago, have sold their stock and goodwill to SWEET, WALLACH & Co. This change became necessary owing to the continued illness of Mr. Thayer, who deemed it to his best interests to close out, as it was impossible for him to attend to the business. The change took place on March 31st. We sincerely regret that Mr. Thayer has had to give up active life, and hope that it is only a temporary release. In the hands of such men as Sweet, Wallach & Co., the friends of the retiring merchant will receive prompt and courteous attention in their business needs.

THE DOUGLASS & SHUEY COMPANY have succeeded to the business of Gayton A. Douglass & Co. in Chicago. They are at present located at 185 Wabash avenue, but after the first of May they will occupy newly arranged quarters at 111 State street.

SHEEN & SIMPKINSON, of Cincinnati, have dissolved partnership by mutual consent. Mr. Simpkinson has a new partner and will continue the photographic part of the business at 166 Race street, under the firm name of SIMPKINSON & MILLER. Mr. Sheen will continue the frame department of the old firm.

DR. G. M. CARLISLE, the well known Treasurer of the Photographers' Association of America, is busy with the affairs of the Buffalo Convention, and all members should give him every encouragement by sending their dues at an early date to G. M. Carlisle, 330 C street, N. W., Washington, D. C.

G. G. ROCKWOOD, the well-known New York photographer, has opened a new studio at 1440 Broadway, near 40th street. The *suite* consists of a fine reception room, studio and store room on the ground floor. Mr. Rockwood has also not forgotten the babies, for which he has made special provision under separate skylight.

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PRINTED ON N. P. A. EXTRA BRILLIANT PENSÉ ALBUMEN PAPER.

PIKE'S PEAK, ROCKY MOUNTAINS.

— SERIES 1. —

NEGATIVES MADE ON

ANTHONY'S CLIMAX NEGATIVE FILMS.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

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THE ACTINOMETER AS A GUIDE TO EXPOSURE.

SOME time ago two English experimenters, Messrs. Driffield and Hurter, took up the question of the relation of the light intensity to the effect on the photographic plate after development. They attacked the question, not from an artistic point of view, but on the side of purely scientific inquiry. For this purpose they first proved by experiment that a harmonious picture has a gradation of light and shade which varies in a geometric ratio. That is to say the relation of the highest lights to the deepest shadows, is in the proportion of 2 : 4 : 8 : 16 : 32 : 64, etc. By another series of experiments they proved that the silver deposited on the negative taken from such a harmoniously lighted object would vary as the figures 1 : 2 : 3 : 4 : 5 : 6, etc. It was further proved that the light transmitted by such a negative varies as the proportion 2 : 4 : 8 : 16 : 32 : 64, etc. It follows from this last fact that a harmoniously lighted object will give a negative that prints correctly if the silver is deposited on the negative in the proportion given above. A certain range of variation from the proportion given is allowable, owing to the fact that the eye does not notice slight differences, but any wide variation is at once noticed in the results that we call under or over exposure. We cannot give all the proofs which these experiments brought forth, but we take space to quote one of the most interesting sections of the work done on this most interesting problem.

"Three separate exposures were made upon different parts of a Cramer plate extending across its width. The exposures given were equivalent to one and a quarter, two and a half and five seconds, the light being that of a standard candle placed at a distance of one meter from the plate. The plate was then cut lengthways into three strips, each of them being impressed with the same three exposures. The three strips were next developed in the same solution of ferrous oxalate for four, eight and twelve minutes respectively:

	Exposure CMS.	Density.	Density ratio.	Opacity.	Opacity ratio.
Strip No. 1, Developed four minutes	1.25	.310	1.0	2.04	1.0
	2.5	.520	1.67	3.31	1.62
	5.0	.725	2.33	5.30	2.59

	Exposure CMS.	Density.	Density ratio.	Opacity.	Opacity ratio.
Strip No. 2, Developed eight minutes	1.25	.530	1.0	3.38	1.0
	2.5	.905	1.70	8.03	2.37
	5.0	1.235	2.33	17.18	5.08
Strip No. 3, Developed twelve minutes	1.25	.695	1.0	4.95	1.0
	2.5	1.140	1.64	13.80	2.78
	5.0	1.625	2.33	42.17	8.51

"The second column gives the densities as measured by our photometer, which numbers relatively express the amount of metallic silver deposited per square inch of the plate. The density due to glass, gelatine and any fog inherent in the film is deducted. It will be seen that the amount of silver increased for the same exposure as the time of development was prolonged. But the third column, which gives the ratio of densities, shows that, within trifling errors of observation, the relationship between the three densities of each strip is identical; that is to say, prolonged development caused each density to grow, but in such a manner that the amounts of silver on the different strips still bear the same ratio to each other.

"It is this unalterable relationship which we refer to when we say that the photographer has no control over the gradations of a negative.

"What we believe has given rise to contradiction of this view, is the fact that, though the density ratios are unalterable, the opacities, which appeal directly to the eye, actually do alter; not only in amount but in ratios also, as is shown by columns 4 and 5. In the first strip, for instance, the extreme opacities were 2.04 and 5.30 respectively, while, after eight minutes more development, the opacities became 4.95 and 42.17 respectively. The lightest shade in strip No. 3 is almost as opaque as the darkest in strip No. 1. The opacity ratios have, however, also increased from as 1 : 2.59 to as 1 : 8.51.

"It is this great difference in the opacity ratios with which the practical photographer is so familiar which leads him to rashly contradict our statements with respect to the unalterability of the density ratios. The great mistake the photographer makes is in assuming that the opacity ratios are alterable at will. This is not so. The opacity ratios alter in accordance with fixed laws, just as surely as by the same laws the density ratios are unalterable. All the control the photographer can therefore exercise in development must result from intelligently working in obedience to these laws, and so rendering them subservient to his own ends. Control in development does exist; but not in the direction popularly supposed."

From these experiments it is extremely important that some method of measuring the intensity of light transmitted by objects to be photographed should be made available for the photographer. Such an instrument is called an actinometer. Various forms of this device have from time to time been proposed depending on the passage of light through varying thicknesses of material that obstructs its passage. In this case no attention has been paid to the quality of the light passing, the luminous rays only being taken into consideration. But it is well known that the rays that have an effect on the photographic plate are those that are not brightest to the human eye. The rays that affect the photographic plate are the blue and violet ones, and these are the very rays that are obstructed by the materials most used in the ordinary forms of actinometer. In other words, the light that passes through the material consists of those rays that are

yellow or near that color in intensity. Quite recently a form of actinometer has been devised that takes note of the blue and violet rays that are reflected by an object that it is desired to photograph. This actinometer depends on the fact that luminous paint exposed to light acquires its maximum intensity after a certain time of exposure, and if this is now taken out of the influence of the light it will gradually fade, the time of fading being a measure of the value of the light in the blue and violet rays that it contains. These rays are the same as those that affect the photographic plate. It is, therefore, only necessary to have some means of determining the moment of fading, to use this principle as a method of determining the value of light from any source, and by comparison with any kind of dry plate to make a set of tables that shall give the correct exposure for those plates under any circumstances.

This novel form of actinometer is the invention of Mr. E. G. Ballard, and is certainly the simplest and most useful instrument of the kind that we have ever come across for the purpose of obtaining an accurate estimate of the time of exposure for any object that it is desired to photograph. The instrument consists of a tube blackened inside, at one end of which is an opening to view the interior, while at the other end there is a disk carrying a surface of luminous paint with an opening in the center, behind which is a piece of blue glass covered with tissue paper, to tone down the light transmitted to that evolved by the luminous paint, when the latter is excited. To use this actinometer it is only necessary to expose the luminous paint surface to the object to be photographed for thirty seconds, then turn the surface so that the light emitted by it is seen in the blackened tube. By now counting the number of seconds that it takes for the light to fade to the same intensity as that transmitted by the tissue-covered blue glass, a figure is obtained that gives the intensity of the light toward the photographic plate. If the value of the plate has been previously determined for that actinometer, and a table of exposures has been made out, the time of exposure will be accurately known from the observation made. We have used this little instrument with much satisfaction and under widely differing circumstances, and must say that we are delighted with the results. The exposures that it told us to give were not what our judgment would have given us from ordinary observation of the light, but they proved to be correct, and the negatives obtained were found to be correctly exposed.

EDITORIAL NOTES.

A SILVER print which has turned yellow by time may be readily brought back to brilliancy and good color by immersion in the following bath :

Saturated solution mercury bichloride in hydrochloric acid....	8 to 10 drops.
Distilled water..	500 grams.

As soon as a purple tone has been acquired the print should be removed and carefully washed, then dried and mounted. A warm tone may be obtained by subsequent immersion in

Chloride of gold and potassium..................................	1 gram.
Distilled water..	125 grams.

This latter bath will keep and may be used till exhausted.

THE editors of the "Annual" are in receipt of articles from Jex Bardwell, of

Detroit, Prof. W. K. Burton, of Japan, and W. H. Bennett, of Brooklyn, which came too late to be available, but which will appear in the Bulletin later.

In this connection we append a note received from Mr. George E. Davenport, of Medford, Mass., intended to appear in connection with his article in the "Annual," but received too late, in which he says that "having decided to contribute some bromide prints to the second annual exhibition of the Mystic Camera Club (February 23, 24 and 25, 1891), I had an opportunity to test still further my eikonogen solution with a result that convinces me that we are only just beginning to understand the remarkable properties of that wonderful agent. I am satisfied that with intelligent manipulation almost everything desirable can be accomplished with it. In using it with the proportion of 1 to 8 of sulphite I find that its action is slowed up so as to be under the same control for over-exposures as hydroquinone, and that by graduating its strength we can get quite a variety of tones to our bromide prints, even approaching carbon in feeling and color. On the other hand, if we so desire, we can make them as black and white as with the oxalate developer by decreasing the proportion of sulphite, quickening also its action in the same way. The excess of sulphite thus appears to give to the bromide print a tone more nearly approaching carbon, and to act as a very powerful restrainer, giving to the action of the developer something of that invaluable quality of hydroquinone which enables us to build up an image gradually and bring out all the finest details. Of course it must be understood that the alkalies used for the accelerator are the carbonates ; with the caustic alkalies, action is quickened very much indeed."

We are notified that the Society of Amateur Photographers of New York has discontinued the publication of its journal, and that their reports, etc., will hereafter be published in the *Photo American Review*, which will be illustrated with work of the society and members of the American Photographic Conference. Members are desired to send some of their prints with descriptions thereof to the Secretary, Mr. T. J. Burton, for publication.

The rules of the China Camera Club with list of officers and members, is before us, by which it appears that the club is in a healthy and prosperous condition, the officers for the present year being, President, Rev. Robert B. Bonnell; Vice-President, Dr. W. J. Miller; Honorary Treasurer, W. S. Emens ; Honorary Secretary, J. Mencarini.

We have received a negative made with a cheap outfit from the house of our publishers, by Mr. Meyer Feder, of Fort Jarves, Texas, which would do credit to a much more expensive outfit and an older photographer as well.

In these days of prolific advertising many firms not only employ agents to travel over the country to verify the statements of bill-posters and sign painters, that certain work has been done, but that there may be no collusion between them, the follower is often required to photograph and render tangible proof in that manner, that the work of his predecessor has been thoroughly done.

The following lines from a member of the Adrian (Mich.) Camera Club will be read with interest by many and may be of assistance to some, in the way of

suggestions contained: "Although our membership is small, the interest manifested is so strong that, during the coming season of 'bright lights' and long days, we shall enroll many new members. We now have a fairly equipped studio in connection with our rooms, and have just secured a perfect working electric lantern. The lantern was built by a member of our club and works like a charm. Electric light costs us but fifty cents per night, and works more satisfactorily than lime lights. The carbons are placed in the lantern in a slanting position so that the projection of the arc is very regular; the feed is regulated by hand and requires an assistant for that purpose. We are enthusiastic slide-makers, and by next winter will have a nice collection for exchange. The Bulletin is read by every member and is a most welcome visitor. Everything points toward a most successful season with us, and your correspondent, with a heart for the amateur photographer, wishes success to associate clubs, to every earnest worker, and to the Bulletin."

The mooted question whether or not aristotype prints fade as readily as silver prints, seems to be nearing a conclusion in the minds of some in favor of aristotope. We are in receipt at this writing of three prints made by Mr. S. S. Wheeler, of Pittsfield, Mass., which are still full of beauty and vigor of tone, and which, Mr. Wheeler writes, were out in the sun all last summer, where albumen prints turned yellow or faded twice in the same time. We should be glad to have somebody else's experience in this matter.

At the second annual exhibition of the Schuylkill Camera Club on the 22d of April a beautiful collection of slides was shown by the following contributors, members of the club: Gilbert F. and George M. Bretz, E. F. C. Davis, William H. Rau, Geo. W. Ennis, Jabez Parker, Robt. Morris, Geo. H. Woltjen, Jr., S. A. Thurlow, A. W. and W. L. Schaefer, A. R. Lattimore, Jay C. Shumway, Ed. Borden, S. W. Patterson, W. C. Yuengling, J. V. Davies, C. A. Toansue and Rev. B. F. Patterson.

We note with much surprise that the case of M. Schlumberger, referred to in a recent number of the Bulletin, has been decided against him and that he has been condemned to pay a fine of 500 francs and damages for having copied a French bank note with the sole aim of demonstrating that it was easily possible to counterfeit it. In view of the fact, too, that he substituted the word liards for francs in the copy, it seems remarkable that he should have received such a sentence. It is his intention to appeal, and we shall look with interest for the findings of the higher court.

It is not often that an accidental double exposure of a plate turns out so nearly a success as did one recently made by Mr. Henry C. Gump of Dayton, Ohio, a print from which is now before us. The first exposure was made in the house, showing a lady seated in a semi-reclining position, and the second, made an hour or more later, on the piazza, of the same lady standing. In the print, the effect is that of two representations of the same person, one seated and the other standing by herself, so to speak, but the remarkable thing about it all is, the harmonious manner in which the accessories of each exposure blend into the other. It is a freak photographic which is of much interest, and we are obliged to Mr. Gump for having called it to our notice.

We would acknowledge with thanks, tickets to the seventh public entertainment of the Boston Camera Club, to occur on May 12th, on which occasion, views of the Yosemite will be shown. If we lived a good deal nearer Boston than we do, we should surely attend.

An interesting exhibit of hand cameras was given at the rooms of the New York Camera Club on the evening of April 20th.

An interesting and instructive photographic conference has just closed in London, which has been largely attended and will doubtless be productive of much good.

We regret to learn that we are about to lose, as a near neighbor, our old friend, Mr. Abraham Bogardus, of Brooklyn, who is about to take up his residence in Stark County, North Dakota, in the interest of the Dakota Land Company. We wish him all success and prosperity in his new undertaking.

A new departure is about to be made in England, in that the Kew Committee of the Royal Society have undertaken to examine and test photographic lenses, and to issue certificates over their signature, which shall bear witness to the various qualities and powers of the instrument under certain specified standard conditions. A reasonable fee only, is charged for this testing, and lenses so tested are engraved in such a manner that their record is incorporated into themselves, and it would seem that it might be of much interest to such manufactures of lenses as make good instruments to know of this project. Applications for testing and all correspondence should be addressed to the Superintendent, the Kew Observatory, Old Deer Park, Richmond, Surrey.

At the April meeting of the Pittsburgh Amateur Photographers' Society the following officers and committees were elected for the ensuing year: President, W. S. Bell; Vice-President, R. F. Smythe; Secretary, J. H. Hunter; Corresponding Secretary, W. J. Hunker; Treasurer, H. W. Beymer; Executive Committee, C. C. Craft, L. S. Clarke, D. Beech, T. T. Brown and R. F. Smythe; Committee of Arrangements, T. K. Gray, J. H. Hunter and W. J. Hunker; House Committee, H. W. Beymer, George D. Heisey, E. E. Erensburg, A. R. Neeb and O. H. Darlington.

In the last issue of the Bulletin by some mistake we stated that Mr. T. J. Burton made a flashlight picture of the dinner of the Society of Amateur Photographers. Mr. Burton has kindly corrected this for us, and states that Mr. Simpson deserves the credit. Let him who merits bear the palm, and our best thanks to Mr. Burton for his trouble in notifying us.

There will be an excursion around New York harbor on the afternoon of May 27th under the auspices of the Society of Amateur Photographers and the Brooklyn Academy of Photography, and it is tendered to the delegates visiting the American Photographic Conference. The steamer *Laura M. Starin* has been engaged, and will leave Jewell's Wharf, Brooklyn, at 12.30 P.M., and Pier 1 North River, New York, at 12.45 P.M. Those desiring to attend should

apply to Brooklyn Academy of Photography: Harry S. Fowler, 578 Halsey street, Brooklyn; Frederick M. Lawrence, 129 Broad street, N. Y.; Starks W. Lewis, 24 South street, N. Y. Society of Amateur Photographers of New York: T. J. Burton, 113 West 38th street, N. Y.; F. C. Beach, 361 Broadway, N. Y.; Fred Vilmar, 66 Duane street, N. Y.

THE annual meeting of the Richmond Camera Club was held on Saturday evening, April 25th, Professor Chas. H. Winston, President, presiding. The following officers for the ensuing year were elected: President, E. F. C. Davis; Vice-President, R. A. Lancaster, Jr.; Secretary and Treasurer, C. D. Habliston; Executive Committee, R. B. Blankenship, Dr. Phil. Taylor; Nominating Committee, H. S. Hawes, J. G. Winston, O. S. Morton. It was decided to have an outing on Wednesday, April 29th, under the guidance of Captain Andrew Pizzinni.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Schools for Amateurs.—Lenses for Amateurs.—New Dark Slide for Fifty Films. —Evening School for Practical Photographers.—Mr. Muybridge in Berlin.

AMATEUR photography is increasing more and more. The most zealous devotees lately are the ladies, and I am fully convinced that within five years we will have more female than male amateurs. We have already two photographic schools of instruction for ladies, one here in Berlin at the Lettes Institute, which is overcrowded, and one recently established at Breslau. The latter was opened on Monday, February 12th, at 11 A.M., in the presence of the Board of Directors of the Breslau Amateur Society and the commission in charge, consisting mostly of experts.

The chairman made particular mention under what favorable prospects this new institute had been called into existence, enjoying the protection of the Silesian Society of friends of photography, and thus securing the management of the studio by able and trusted hands. The immediate application of eight female scholars for the first course was particularly gratifying, being ample proof of earnest endeavors for the work. The scholars were then introduced, after which Engineer Kleinstüber spoke in appropriate terms about the purposes and plans of the photographic institution. A few portraits of children were then taken to commemorate the event, and the new studio will now also be open for the accommodation of the general public, who can have their pictures taken from *cartes de visite* to life size. The optical establishment of Voigtlander, in Braunschweig, in consideration of the enterprise, had been so kind as to donate two, and the optical establishment of Goertz, in Berlin, one of their excellent objectives. This is certainly sufficient proof of the high esteem in which the newly created institution is held by the aforesaid firms. I believe that in a very short time we will have a female amateur society here on the same principles as the already existing society of female artists, who hold their artists' festivals among themselves (without men). In the United States, I suppose, such a movement must also be expected; I have noticed that most of your advertisements of amateur apparatus are illustrated with female figures. There is no doubt that in consequence of this increase in the number of amateurs the sale

of articles for their requirements will also be considerably increased. This is the reason why the genius of the inventor gives the preference to detective cameras, instantaneous shutters, developers, toning baths and the like for amateurs, and I am really surprised to hear that an old-established firm of twenty years standing should do only one-tenth of their present trade with professional photographers against nine-tenths with amateurs. Is it to be wondered at then that there is a greater demand for cheap objectives, and that firms like Goertz, in Schoneberg, near Berlin, have already gained a name in the manufacture of cheap objectives. They are mostly of the aplanat system, and have proven and are recognized as very good.

As a general thing amateurs are embarrassed when they have to select an objective; the optical price list not being comprehensive enough to them.

If economy is an object and the means permit the purchase of only one lens, I would, therefore, advise to select an aplanatic system, whose proportion of opening to the focus is from 1:6 to 1:7. This is sufficiently rapid to take instantaneous pictures during the summer months, and even groups; but the latter are under roof or screen, to keep off the top light.

An objective should be selected whose focal length is equal to the length of the plate or about four-fifths of the same, but cutting the plate sharply to the

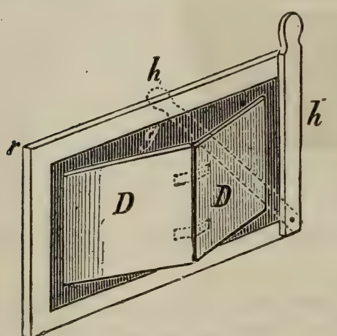


Fig. 1.

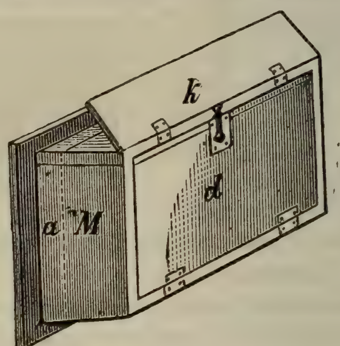


Fig. 2.

corners with the smallest diaphragm. Such an objective has an angle of about 60 degrees, and this is fully sufficient for landscapes and architectural views.

With a wider angle the foreground will become forced and distorted; but for architectural views in narrow streets or highland scenery they may be required. The finest of this kind (visual field over 90 degrees) are the new lenses of Dr. Zeiss, in Jena.

Lately, the films have been used considerably by amateurs, particularly since Perutz in Munich manufactures them, and film dark slides (film carriers) have come into general use in place of the roll-holders. This new holder will carry any number up to fifty and even more films. The weight for 13 x 18 cm. size is 750 grams, fifty Perutz films 13 x 18 cm., weight about 260 grams; the total weight, when filled, is therefore, 1,010 grams, while two double plate-holders with four glass plates weigh already 1,000 to 1,200 grams. The holder is made in different sizes and can be fitted to any camera. For films 9 x 12 cm. the changing holder weighs 600 grams, fifty films 125 grams, total, 725 grams, therefore not more than two double holders with four plates.

Samples in the photographic laboratory of the Royal Technical High School, Berlin, have demonstrated the usefulness of the holder.

The holder consists of two parts: a front part similar to an ordinary plate holder (Fig. 3) with shutter, behind this a light of polished plate glass *g*, against which the light sensitive film is pressed. Something entirely new is the printing arrangement as represented in Fig. 1. It consists of a hinged cover *D D*, which can be bent backward, when the lever, *h*, which can be turned and lays behind the same, stands up vertically. In this position a film can easily be inserted, so that it comes to lay on the glass plate. If the lever is turned down it will press the cover *D D* flat, by which motion the film is pressed against the glass plate *g* (Fig. 3).

The changing of the exposed films takes place by lifting the lever, opening the shutter *k* (Fig. 2), which shows the magazine in the rear part of the holder, and which is held closed by means of an elastic spring ; taking the exposed film with the fingers and placing it in the front part of the magazine space *M* (Fig 2),

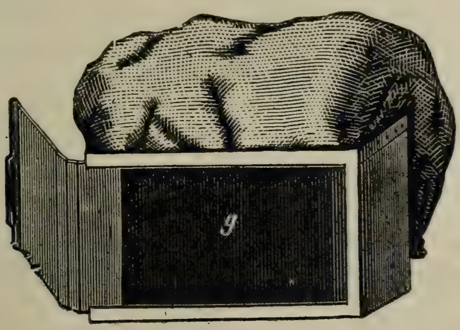


Fig. 3.

which latter is separated by a board ; after this, one of the unexposed films which lay behind the board, is taken and placed behind the glass *g*.

All this is done inside of a light-tight changing bag (Fig. 3) which is pulled over the right hand, so that the changing, which requires hardly a minute, can be done in daylight. But the shutter *k* must be closed before the hand is withdrawn from the bag. The filling of the magazine space takes place after opening the back wall *d* (Fig. 2). It is important to clean the mirror plate *g*. For this purpose the hinged cover *D D* (Fig. 1) is removed in the bag, placed in the magazine *M* and the glass is then cleaned with a chamois skin. The outside glass must also be cleaned.

The foregoing, I suppose, is enough talk about amateur photography. But what are the armaments of the professional photographer toward the increasing numbers of amateur photographers?

My answer is : Provide yourself with more brain, more brain ! Prove tha you know more and can do more than the amateur with his Detective camera. This was the principle by which the Society for the Promotion of Photography was governed at the establishment of the Evening High School for Photography of this place.

The same was opened January 5th, and numbers at present sixty-one scholars. Of these five are employers, twenty-five employees, and thirty-one apprentices. The programme is the following : Monday evening from 8 to 9 o'clock, Photographic Optics, lecture by Dr. Miethe. Tuesday, 8 to 9 o'clock, Photographic Art, Professor H. W. Vogel. Wednesday, 8 to 10 o'clock, Lessons in Re-

touching, by Herr Kopske. Thursday, 8 to 10 o'clock, Drawing, by Ad. Mayer. Every first, second and fourth Friday of each month, 8 to 10 o'clock, Photographic Chemistry, Herr Schultz-Hincke. Saturday, 8 to 10 o'clock, Drawing, by Ad. Mayer. The entrance fee is 3 marks for apprentices, 5 marks for employees, and 10 marks for employers. This is the only money to be paid.

The government supports this enterprise by an appropriation of 500 marks ($120). It is eminently successful, and I wish every large city, by supporting domestic photographers, would establish such an evening high school.

Mr. Muybridge, from the Pennsylvania University, has been here in Berlin, and has given an exhibition of his animals in motion before a very select audience.

The first exhibition of Muybridge (by invitation) was attended by His Excellency Minister von Gossler and many celebrated artists like A. Menglel, L. Knam, P. Meyerheim, Siemering, Calandretti, Becker, Counselor Foerster, Professor Preyer, Dr. Giessfeld, Helmholtz, Dubois Raymond. It was one of the most original exhibitions of its kind ever given to the public, and was richly applauded. Mr. Muybridge enjoyed the congratulations of Mr. von Gossler, Professor Siemering and Dr. Giessfeld. One of his performances was also visited by the genial old war-horse General Field Marshal Moltke. The general gave also to Mr. Muybridge an invitation to call at his office for the purpose of studying his big album.

A chief point by which Muybridge differs from his competitors, whose merits are not to be overlooked, is that he is not satisfied to take the running animals from the side only (vertically from the direction of their rear), but that he takes them simultaneously from the front and from behind by placing twelve cameras sideways of the track in front, and twelve cameras behind the running animals. These he worked with three camera batteries (with Dallmeyer lens) in such a way that by an electric shutter the three cameras, No. 1, then No. 3, No. 2, are exposed simultaneously, and that at the same moment he obtains not only one but three views (from the side, front and behind). This admits a study of the anatomy of motion, which can never be accomplished by a simple side view, and particularly the study of abbreviations, is for artists of the greatest interest.

This was a novelty even for Berlin, and was greatly admired by all our prominent artists.

Another peculiarity of Muybridge's exhibition is the circumstance that he shows horse representations of all ages (Egyptians, Assyrians, Romans, Greeks) and modern (Meissonier) besides his instantaneous views, and he adds critical remarks about the correctness of the movements.

We do not want the artists to work exactly after instantaneous pictures, but they should study a little anatomy, and of equal interest is for them the study of anatomical motions.

Astonishing are also his animals in motion, shown by the Zoopraxiscope.

BERLIN, April, 1891.

THE number (of the BULLETIN) for March 14th was worth to me many times the subscription. The article on "Quinol and Eikonogen," helped me out of many difficulties, also the one on "Intensification" was of great value.

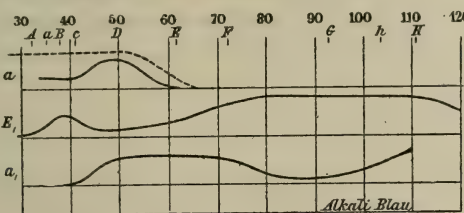
H. STEWART, JR.

THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES.

BY J. J. ACWORTH, PH. D., F. I. C., ETC.

(*Continued.*)

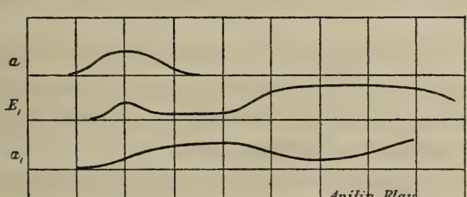
Alkali Blue, 6B.—This dye dissolved easily in water or alcohol and water, and gave a partial precipitate with silver nitrate. A gelatine film stained with a small amount of this dye gives a maximum absorption at *D;* with a larger amount the absorption begins at *E*, rapidly increases to a maximum and continues to the end of the less refrangible side of the spectrum. Added to a "fine-grained" silver bromide emulsion, general sensitiveness is at once reduced. The best proportion of dye to silver bromide is about 2 per cent., and in order to help general sensitiveness I added .05 gram $AgNO_3$ to every 2 grams AgBr present. This dye sensitizes from *A* to *C*, with a maximum at *B*. From *C*, sensitiveness decreases to *D*, after which it again increases and attains its maximum in the blue and beyond.



See foot note for explanation of drawings. *

The absorption of this emulsion, starting from between *B* and *C*, reaches a maximum at *D*, continues until *F*, when it rapidly decreases to a broad minimum by *G*, after which it again rises.

Anilin Blue.—Anilin blue is soluble in alcohol or alcohol and water, and gives no precipitate with silver nitrate. The absorption of a film of gelatine stained with this dye is most intense between *C* and *E*, reaching a maximum at about *D*. The best sensitizing results were obtained by using .03 anilin blue grams of AgBr present, and .05 $AgNO_3$ (free) to make the emulsion more sensitive. Sensitiveness begins at *C*, reaches a maximum at *D*, after



which it gradually decreases until *F*, when blue sensitiveness begins and soon reaches a maximum. It is noticeable in the case of this dye that the sensitiveness maximum (in the red) very closely coincides with its absorption maximum in gelatine, this being of somewhat unusual occurrence according to the well accepted theory regarding the displacement of the sensitizing action of the dye

* Reference note to drawings.—The curve marked '*a*' on the top line in each division refers to the spectral absorption of the dyed gelatine film alone.

E_1, refers to the sensitiveness curve of the dyed gelatino-bromide emulsion.

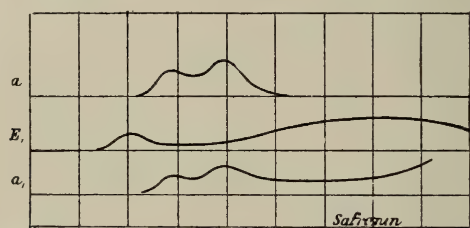
a_1, refers to the absorption curve of the same dyed gelatino-bromide emulsion.

E_1 and a_1, E_2 and a_2, E_3 and a_3, etc., in each case refer to the same dyed emulsion.

The vertical lines in each drawing correspond to the numbers as given in the drawing of Alkali Blue.

toward the red end; no other dye that I have experimented with showing so little displacement of spectral sensitizing action when compared with its own absorption in gelatine. They would appear almost identical, but further experiments would be required to prove or disprove this. The absorption of the dyed emulsion starts at about *B*, rises very gradually and reaches a maximum at about *F*, decreasing again at *G*, after which it rises as shown in the drawing.

Safranin.—$C_{21}H_{22}N_4HCl$. This dye is easily soluble in water without fluorescence, soluble in alcohol with yellow fluorescence, but insoluble in ether. It is highly tinctorial and depresses general sensitiveness greatly even when used in small quantities. $AgNO_3$ gives a partial precipitate insoluble in water. In a gelatine film the absorption consists of two bands, the first starts from $D\frac{1}{3}E$, reaches a maximum just before *E*, thence running down to a small minimum at $E\frac{1}{3}F$, thence to a second maximum at a little before *F*, after which it runs down to nil at $F\frac{1}{2}G$. I found the best amount of dye to add to every 2 grams of AgBr contained in an emulsion is .025 gram, besides .050 gram $AgNO_3$, and 5 c.c. ammonia, S. G. .937, to help sensitiveness. This emulsion gave a band of maximum sensitiveness at *D*, but rather on the more refrangible side, showing, however,



a continuous sensitizing action through the green, after which the usual AgBr sensitiveness begins. Eder says in "Photographie mit Bromsilber," page 168: "Safranin is a good sensitizer for green, its action stretches itself by longer exposure, until somewhat beyond *D*. In my experiments the action in the green rises to no strong maximum, but runs till *E*, when the curve of action toward blue quickly rises." Eder gives a curve which, however, does not quite compare with mine. A remarkable peculiarity appearing in all my results with safranin sensitized plates exposed and developed in the usual way is, that from where the region of spectral sensitiveness ends on the less refrangible side, between *C* and *D*, to the end of the exposed spectrum beyond *A*, there is a district showing not only total want of sensitiveness, but considerable bleaching action throughout, and although a plate may fog chemically all over, in this district it resists the developer and remains bright and clear to the end. At present I have no solution for this phenomenon. Although the dye sensitizes for one band only, the dyed emulsion shows two absorption bands very similar to the dye itself.

Anilin Red.—For experiments with this dye I used Rosaniline Chlorhydrate. This dye is easily soluble in water containing a little alcohol. $AgNO_3$ causes slight opalescence and enriches the color considerably. In a dyed gelatine film the absorption begins at *D*, rising to a maximum at $D\frac{1}{3}E$, as shown in the drawing. The amount of dye I found to answer the best for sensitizing was 1 per cent. to that of the AgBr present. A small amount of ammonia (too small to interfere with spectral sensitizing action) was used to help sensitiveness.

This emulsion gave a sensitized band at *B* reaching a maximum before *C*,

and again becoming nothing at $D\frac{1}{3}E$, thence rising again at $D\frac{1}{2}E$, showing but slight sensitiveness until where the region of blue and violet sensitiveness commences.

The absorption of this emulsion begins at D, quickly reaching a maximum at $D\frac{1}{3}E$, thence decreasing slightly at $D\frac{1}{2}E$, remaining the same until $F\frac{1}{3}G$, whence it again diminishes slightly, as shown. In the case of an anilin red dyed

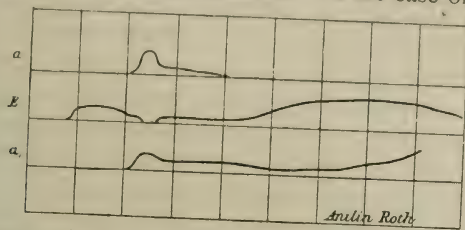
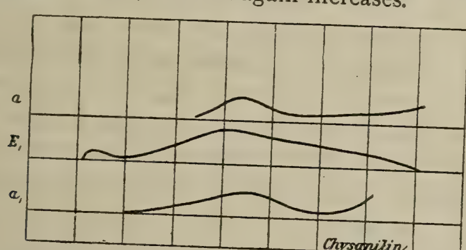
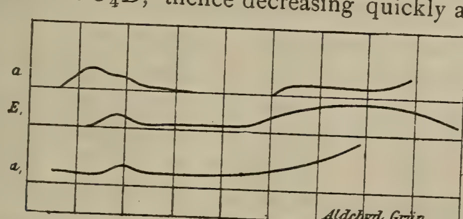


plate the sensitizing action is considerably displaced as compared with the absorption of the same.

Chrysanilin.—$C_{20}H_{17}N_5HNO_3$. Dissolves fairly well in a mixture of alcohol and water. The gelatine dyed film shows an absorption commencing at $E\frac{1}{4}F$, attaining a maximum on the more refrangible side of F, thence showing general absorption to the end of the spectrum. The best quantity to add to every 2 grams of AgBr present in the emulsion is about .07 gram with a little ammonia. This emulsion gives two bands of sensitiveness, a weak one by $C\frac{1}{2}D$, and a strong and wide one at F, and between both a minimum. The absorption of this emulsion begins at D, and reaches a maximum at $F\frac{1}{3}G$, after which it gradually becomes less until G, when it again increases.



Aldehyde Green.—With this dye it was very difficult to obtain satisfactory results. It is almost insoluble in water and not very soluble in alcohol. I employed about .005 gram of the dye to every 2 grams of AgBr present in the emulsion. This dyed emulsion shows a single band of sensitiveness, commencing at $C\frac{1}{3}D$, attaining a maximum at $C\frac{3}{4}D$, thence decreasing quickly and maintaining an



even sensitiveness through E and F, when the usual blue violet sensitiveness commences. The absorption in this case was more generally than locally strong, and I determined it visually—the only case in the series I did so. There appears to be a slight maximum at D, as shown in the drawing.

(*To be continued.*)

PHOTOGRAPHY IN THE CELESTIAL EMPIRE.

BY ROMYN HITCHCOCK.

TIENTSIN, CHINA, March, 1891.

I HAVE been somewhat agreeably surprised to discover the interest manifested in photography by many residents in China. Here in Tientsin, which is a very large Chinese City with only about two hundred foreign residents, the Tientsin Amateur Photographic Association was organized last January, with about twenty members. The United States Consul at this place, Dr. William Bowman, is one of the active members, frequently to be observed active in snapping the Detective which he recently obtained, and there are a number of others who are very successful with cameras of various kinds. The Secretary of the society is Mr. H. J. Bostwick. The present writer is not a member, being only a sojourner in the land, but it was his privilege at the first meeting to give a demonstration of eikonogen development, with the last portion of that agent he possessed. Eikonogen in crystals does not keep well. The surface turns black, and to make a solution of proper color it was my custom to weigh out double the quantity required. Wash it in water, which readily dissolves the black portion, and then dissolve the white residue in the sulphite and alkali. A serious loss is thereby sustained. Owing to the difficulty of obtaining good eikonogen, I have returned to the use of pyro. Perhaps the dry powder preparation recently introduced will once more bring the former agent into favor in this distant land.

Peking has several very successful amateurs. Among these are Mrs. W. H. Brady, of H. B. M.'s Legation, and Professor Vapereau. Mr. Howard Martin, First Secretary of the United States Legation, has recently obtained an excellent "Optimus" camera and lenses, with which he will be able to do work of the best quality.

At Shanghai there is the China Camera Club with about forty members. I am not acquainted with the work at Shanghai, but Mr. W. S. Emens, the United States Vice-Consul General, is an active member of the Camera Club, and has had considerable experience.

Plates from the United States are not much favored in North China. The reason for this is not obvious; but it may be because they are not much known, and that there is nobody to introduce them. Wratten & Wainwright's plates are conceded to be the best, but they cost much more than others. The Ilford and the Thomas plates are doubtless most used. I have used both, and for landscape work, or indeed for anything except gallery work, they are perfectly good. They sell for $4.50, Mexican, per dozen for "special rapid," 8 x 10 size. But the prices of plates in China are not uniform. Messrs. Hall & Holtz, at Shanghai, charge me $6.50 for Ilford "special rapid" plates. I bought the same of Llewellen & Co., for $4.50. At Tientsin they charged $5, but at Peking $4.50 again.

Seeking for information, I asked the salesman at Hall & Holtz's, why the American plates were not used, as they could be furnished so much cheaper. I thought $6.50 an exorbitant price. He told me that American plates were not good! I ventured to remark that there were a few photographers in the States of some note, who actually used such plates. He declared that his house could not afford to sell plates any cheaper. Well, I preferred to buy elsewhere for

$4.50. But I have recently learned exactly what one invoice of Thomas "extra rapid" plates cost a dealer in Tientsin. They cost $3.13 Mexican per dozen.

The demand for plates in China must be very large. The Chinese do considerable work themselves. Most of it is of an inferior quality, it is true, but the same may be said of much of the work by foreign professionals. These strictures apply to North China and particularly to this city and to Peking. The best professional here is Heng Chang, a Chinese, who does really good gallery work. He uses Wratten plates only. I would gladly do whatever I can to introduce our own plates in China, but as a primary step I would wish positive assurance that the plates should be packed to meet the requirements of the trade. This would involve the use of paraffined paper to protect them from moisture, the plates being wrapped in packages of four with at least three separate wrappings of such paper. Thus, if shipped in metal-lined cases, they would come *via* Suez Canal in good condition and they would keep through the wet season at Shanghai or Hong Kong, when unpacked. It is a too common impression in the East, that certain makers of plates in the States have been so unwise as to send inferior plates to Japan and China, thinking to get rid of them to the unsuspecting Celestials. While I do not credit the story, I do know of one instance which partly justifies it, to those who did not know the circumstances of the shipment.

American plates are better adapted to the warm climate of China than plates made for use in England, because they are less subject to frilling.

A SUGGESTION FOR A POSSIBLE METHOD OF IDENTIFYING THE COLORS PHOTOGRAPHED.

BY JULIUS F. SACHSE.

[Read before the Photographic Society of Philadelphia.]

THE production of orthochromatic or color-stained plates, which will yield negatives or prints giving approximately true color values, is at present one of the most active problems of the photographic world, attracting the attention of specialists and active researchers in almost every country.

These color sensitive plates, by reason of improvements made in the dyes used, thus insuring their stability or keeping qualities, in addition of increasing their sensitiveness to shades of color, together with the reduction in the price of manufacture, has of late increased their popularity with the professional as well as the amateur photographer, so that where but a short time ago they were only used by experimentalists, and by a few professionals for copying art paintings and like subjects, they are now coming into general use in all branches of photography, from studio portraiture down to the snap-shot of the hand camerist.

Ever since the orthochromatic principle was first broached, the hope was fostered that by some means, in addition to giving true color values, it would become possible to find a method to distinguish or identify by the print the colors in the original. This problem has for a long time remained a matter of conjecture and research, engaging the attention of the best known photographic students and theorists at home and abroad, as is instanced by the experiments with the solar spectrum and shades of color—thus far, however, without leading to any practical method by which the colors in the original might be identified at sight.

In connection with this subject, I wish to bring to your notice a suggestion

for a simple method by which this much-desired object may be obtained, at least under certain conditions in suitable subjects, as you will see by the results shown by the negatives and prints as well as on the screen.

The experiment may be considered a partial solution of the problem, at least within the scope of the subjects and colors upon which I was able to experiment. The subjects were entomological and ornithological (butterflies and birds), and were selected with reference to the brilliancy of the colors and the difficulties which they have heretofore presented to the photographer.

The suggestion, as you will perceive, is simply to photograph a color key along with the subject, which shall explain itself.

Of course, I do not for a moment wish to claim that this method will work in every case and subject, or where there is a marked admixture of white or black with the respective colors; but under stated conditions, for such subjects as indicated, as well as other departments of natural history, where the colors of the insects, animals or flowers are bright and decided, I do claim that with suitable orthochromatized plates, and where the requisite care is taken to prepare the color key, and to ensure correct exposure and development, the suggestion, simple as it is, will be found to work satisfactorily, and that the colors of the original can be distinguished or recognized in the print in every case by the student who is able to judge, regardless of how much it might puzzle the general observer who is not at all familiar with the subjects.

I will now call your attention to the negatives and prints, and will state that they were made on the ordinary commercial plate, with a portable outfit, in the Academy of Natural Sciences of Philadelphia, with a poor side-light, under very adverse conditions. The first picture (No. 1), a print of eight butterflies, selected on account of their varied colors, which comprised lemon-yellow, brilliant blue, blood-red, orange, bright red and black. Care was taken that the specimens, with the color key, should all be upon the same plane, and to ensure an equal illumination.

The color key was formed of a plain white card, upon which was fastened pieces of tissue paper matching in color the hues of the moths, two of the shades, the bright blue and the red orange, I unfortunately was not able to match exactly from the resources at my disposal as well as they might have been. However, crude as this experiment is, the result will prove the correctness of the principle as suggested. With the use of a color screen or light filterer much better results can be obtained, which I trust to show you at a future meeting. Still you will perceive that the four colors can be easily identified in the subjects.

The plates used were the regular Carbutt Orthochromatic, Sens. 23. The development was with the Combined Developer as per formula in *American Journal of Photography* (February, 1891, p. 91). I will also state that plates of the same emulsion, but not orthochromatized, did not prove successful, as you will see by comparing the prints numbered I, VII, and VIII, respectively. The attempt to attain the results by pyro and soda developer also resulted unsatisfactorily, all things being equal.

In the next subject the sittace macao, or red-and-yellow maccaw—a very unpromising subject—you will see on the print from an orthochromatic plate the five colors, cream, blue, yellow, red and green, are all plainly marked or discernable, while on the print from a plain plate there is but little distinction between the two first colors or the three latter ones.

One matter I overlooked in this experiment, viz: In making a color key always to include black where it appears in the subject, as where bright, deep red and black appear close together, as in this subject, it would be hard to tell which was the red from the black, especially if strongly printed.

The question may be asked, of what practical value or extended use is this color key? In reply I will state, first, from a scientific point of view, that any process of reproduction by which the natural colors can be deciphered, or even approximated, must prove of the greatest value. This is especially true in the department of entomology and ornithology. Further, the absolute truthfulness of the photographic processes is far in advance of laborious and expensive hand productions which are now used in the study of scientific matters. In addition, our present illustrations too often carry with them the individuality or imagination of the artist, to the detriment of nature, notwithstanding the great care taken by scientists to obtain pictures true to nature.

Then we have the great search power of the camera, with perhaps its greatest possibilities yet undeveloped, showing the structure of insect life, with a fidelity to nature in its most minute parts, unequaled by any other process, which is now supplemented by the simple process brought to your notice this evening, foreshadowing the possibility of distinguishing the various shades of color in the original.

From the commercial point of view the above application cannot be overestimated, as you will see that by the aid of the color key and orthochromatized plate a negative can be obtained from which a half-tone (Ives) process block can be made, retaining the gradations of shade necessary to the identification of the shades of color in the original, thus opening a field for the production and illustration of scientific works on a scale heretofore impossible, while at the same time reducing the price and increasing the value, which cannot but help to popularize the study of the scientific subjects to which the process is applicable.

PHOTOGRAPHING SHAD.

BY ADELAIDE SKEEL.

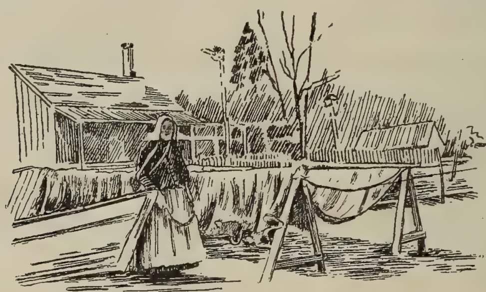
LEST the title of this article prove misleading, let me hasten to say that it is I who am photographing shad, not the shad who are busied with detective or view cameras. Indeed their one destiny and occupation appears to be the same as that of lovely woman, to be caught; hence these simple outlines of the way our fishermen do it on the Hudson River.

"We must take the current when it serves or lose our ventures," and the shad season lasts less than two months. Early in March our professionals—for there are no amateurs in this sport—make excursions from Catskill and places in that vicinity to New York Harbor and the Narrows, where they haul their catches by means of drift-nets, and it was a lantern slide a friend showed me of this marine procession returning homeward with its flotilla of round and flat-bottomed boats, tugged by a lusty little propeller, that fired my enthusiasm on the subject. Photography with me, however, is never entered into lightly nor unadvisedly, although to be in the fashion, I often do pretend to have

caught some long studied effect by a happy chance. My shad pilgrimage from my dark room to the river, a distance of a quarter of a mile, was not accomplished without great mental and physical exertion. The season was March, and the wind suited the season; can I say more?

One has someway preconceived, romantic, not to say religious, ideas of fish-

ermen, which are alas! rudely scattered at the sight of their encampments, which are not apostolic in character if the old master sketched from life. The settlement upon which my camera intruded consisted of one old canal-boat, drawn like Peggotty's house, on the shore, in which ten or a dozen men slept and ate during the shad season. The cook of the crew seemed to be a little above the



rest in social standing, but none of the crew appeared to be what we call "in the swim" of fashionable life. Nobody appears to go a-fishing for fun, although I trust there is fun in it for somebody, when the sixty days net one million of fish, valued at two hundred and seventy-five thousand dollars. The occupation of the men, as I approached, was that of pitching pennies; but when

I left the crowd at the house-boat door I found a solitary figure mending a coarse twine net.

Of course I took him without delay, and a very artistic picture he made, with the river outlining his figure, his nets and eel boats as foreground and accessories. I did not learn, till on a later occasion, that my model stood by a

herring, not a shad net, which latter, it seems, is made of the finest spool cotton. In my second attempt I coaxed a woman to pause in her occupation of driving her chickens out of her parlor, to stand half a second in a Grace Darling, Ida Lewis, Miranda or Mrs. Isaac Walton pose. In return for a blue print, this terrestial mermaid afterward became my partner and much valued chaperone on all my shad pilgrimages. Her house was on the shore, her bark was on the river; and she knew the fishermen so well, that when I photographed a group, artistically placed by their nets, she added a Bret Harte flavor to the scene by her brief biographical remarks:

"He were took up for beating his wife, miss, and he were in a year for house-breaking. He cut ice two winters ago, and the fellows do say he made off with——." But, no, it is not fair to tell more, since "that belongs to another story," as Kipling would say. On an orthochromatic plate, which I used without a screen, the outlines of these fellows came up sharply, and besides, they were kind in taking me out in their vile-smelling flat-bottomed boats to exhibit the stake-nets, which are the local feature here. I disappointed them, I fear, by refusing to take a bird's-eye view of these seines, which, thrown across the river, catch the poor shad against the tide, preferring views of the laden boats when they come into the wharfs of the neighboring villages to unload their silvery cargo at the fish markets. Better than this would have been flash-light pictures of the starting out at two in the morning, when the lanterns are stuck on poles in the oarlocks, and the shad waked up from their midnight slumbers to be caught. It is hard work for the fishermen, but good profits while the season lasts. If the man can be believed who told me, he often realized two hundred dollars a week. This makes shadding rather more remunerative than literature or photography; but I think from the undecorated appearance of its votaries the money made must be given to the missionaries or put in the savings banks.

This leads me to lament the hard realistic fact that shad-fishermen prefer to wear their old best clothes rather than the picturesque flannel shirt costume of amateurs. I persuaded one man to take off a dress-coat which had seen more eels than ballrooms, only to be confronted by the hard outlines of his Derby hat. Contrasting these hopelessly attired subjects with the St. Peters who so gracefully girt the fishercoats about them in Raphael's sketching days, I gathered up my traps, cheered by the ray of hope that the realism of my outlines might give them value to those who care more about to-day than yesterday; and truly this is the way men look when they are after shad.

WOMEN AS PHOTOGRAPHERS.

In a recent address before the Women's Industrial Union of Syracuse, Miss Catherine Weed Barnes strongly advocated the proposition that women should take up professional photography as a means of earning a livelihood. It is an important paper and is given herewith in full:

"My talk, to-night," said Miss Barnes, "will be a very plain, practical one, and I will try to set clearly before you the advantages of this work as a means of wage-earning. No profession can be thoroughly learned without labor, and it is growing more and more necessary to do a thing well to win recognition in the close struggle and competition of our busy life of to-day. People demand the worth of their money more than they ever did, and those who furnish poor work never will win lasting success. In one of the recent photographic annuals, I advocated strongly women

taking up this business, as it seems especially adapted to those who are willing to undertake the needful training, and they must at the outset, drop many of their preconceived ideas concerning it.

"I am, of course, an amateur, but I have tried to study as if this work was to be my regular profession. 'Whatever is worth doing, is worth doing well,' was told me often when a child, and it is specially good that women should remember it, for they are not usually taught as men are, systematically and thoroughly. Men have so long held the most advantageous place in the various professions simply because they are expected to make a business, and not a pastime, of what they undertake. This is not caused by the size of the masculine brain or the amount of gray matter in it, but is largely the result of their training, and if women will go through the same hard work, not expecting any royal road to learning because they are women, and fitting themselves to stand the same test as their brothers, they will deserve and win the same rewards.

"It is not by saying that women ought to have admission to any trade or profession which will open its doors to her, but by her quietly and steadily proving her ability to do the work well. Once show you can do anything well, ignoring the question of sex by never obtruding it, at the same time thoroughly respect your womanhood while you firmly hold every advantage gained, and the respect of men whose respect is worth having will be yours. Women must learn, however, to take sharp criticism, as men have to do. They have no right to special consideration beyond the courtesy due from every man to every woman, but it should not be on their part, all take and no give.

"I believe that every woman, like every man, in this country, should have some means of earning a living, if obliged to do so. Photography to me, while a source of great pleasure, has been no mere pastime, and, on anyone who takes it up as a business, I would urge practical study of every part of the work from the beginning, although much of it you may never practice afterward. But you will understand how to direct others as you never could by merely reading or being told.

"Thc camera, as used in the ordinary studio, is familiar to almost everyone, but few understand the office of the lens. It should be the first thing studied. Almost always the exclamation uttered by those who see an image on the ground-glass of the camera for the first time is, 'why, it is upside down.' The explanation is simple. The eye is, in fact, a lens, differing from it in one important particular. The image formed on the human retina falls on living nerves, not on a flat lifeless surface, and they correct what would otherwise be a reversed image. The lens has no such power, but can only collect the rays of light, so as to receive on the sensitive plate (which replaces the ground-glass when all is ready for the picture) the reversed image which we therefore call a negative. It would require a diagram to explain why the upside down becomes right side up. We get a positive, or in other words, a finished picture, by placing sensitized paper or other substance back of the negative, and using daylight or artificial light to print through the latter.

"Without going into details, fascinating as they are, I will only give those necessary to make my meaning clear, and then show you some examples of women's work by means of lantern-slides. Both negatives and slides in each case were made by women members of the Society of Amateur Photographers of New York. Few professionals attempt these unless they make it a special business. Portrait operators have no time for the work, which is a branch in itself, requiring much care and judgment, besides artistic taste, and is entirely different from ordinary studio work. I advise all women who take up photography as a profession, to decide first what special branch they will follow, and not try to cover the whole field. The latter course is very expensive.

Patience a Necessary Article.

"With portrait work, if the studio is large, only one lens is needed, but that

should be as fine as can be afforded; economize wherever else you must, but you can do nothing if your lens is poor. In a short studio you may need two or three, to make up for lack of space. You can go to almost any length as regards expense in the matter of accessories, back-grounds, etc. In making interiors, it is well to have a large and a small wide-angle lens.

"Women who go into portrait work will learn a great deal of human nature and find themselves daily called upon to exercise more than Job's patience. He was only obliged to endure, and could give vent to his feelings, while the photographic operator is forced to appear the soul of amiability, and like the sun, smile on all alike. Even as an amateur, I have learned to feel for the professional, and can admire his patience when called on to do the most absurd and unreasonable things at the sitter's pleasure. He must, if the sitter desire an almost immediate delivery of the finished print, bid the sun shine, hold back clouds and rain, must correct with lightning touch all physical blemishes unkind nature has caused, and, in short, remedy each and every error which prevents the portrait being satisfactory. In this matter we women are supposed to be more particular than men, but I can testify that the facts do not bear out the supposition. People generally do not wish for an exact photograph. They want not only to appear at their best, but often at some one else's best, as shown them in the gallery album, and insist on positions or costumes the skilled operator knows will not suit them when all is done.

Four in One.

"In a professional gallery, said the speaker, the man who poses sitters generally develops the negatives, while the retouching is given to a second one, the printing and toning to a third, and the mounting and burnishing to a fourth. The amateur is expected to do all this himself. Retouching is very hard on the eyes, and should not be done by whoever does the posing and developing. In a studio, everything must be reduced to a system. The public is generally satisfied if a photographer works on in a sort of treadmill, as regards poses, etc., but there are sometimes sudden attacks which sweep over a community and render a certain pose or mode of printing fashionable. Then the professional who watches the great sea of public opinion and comes in on the top wave, reaps a harvest, but the fashion proves fleeting and is swept aside by something else. Few sitters appreciate the care and thought and nervous strain requisite for a photographer, to carry out a cherished ideal, and continue to think of picture-taking as only a magic trick, and not a genuine art of years of study, as with painting, sculpture or music.

"I am now in communication with a young woman who has adopted this profession, and is succeeding because she is willing and anxious to learn. Besides carrying on her studio, she is taking regular instruction in one of the Chautauqua corresponding classes. She makes a specialty of women and children. The work is infinitely more refined and womanly than much which is eagerly sought after by women, and those who are determined to learn, can, to a great extent, make their own future. No matter how many times you fail, keep at it, and you will succeed, providing you search every time for the reasons of failure, and do not let such occur again. In studying the development of negatives, a woman must learn to ignore the question of personal daintiness. Chemicals will stain, glass will cut, and rubber gloves are a nuisance only to be endured when the solutions are positively dangerous, as in sensitizing the tissue for carbon printing when bichromate of potash is used.

A Practical Knowledge of Chemistry Necessary.

"I would strongly advise starting with a course of elementary chemistry and practical experiments, and this part of the work to me is one of its most fascinating branches. Then one should understand the theory of light, its action and management, but much of this can be learned only through experience, and, as in posing sitters, this needs to be supported and inspired by keen artistic insight, which can be trained almost

beyond belief, so that posing becomes largely a matter of instinct. Think all the time where improvement is possible in your instruments or manner of work ; read constantly and, at first, only simple manuals of instruction ; experiment for yourself, and while being always ready to learn, do not let yourself be blown toward all points of the compass like a weather-vane by every passing wind of what seems to be information. There is so much really to learn that one cannot afford to waste time.

" Photography is a work in which one must keep informed as to the various discoveries constantly being made. Learning how to manage a camera, to focus, to develop a negative, and make an ordinary albumen print, is by no means all there is to photography. One's inventive faculty is stimulated by it in mechanics, chemistry, optics and art. You learn to see what was once unobserved, and it is a good plan to mentally pose people in the street, in company at home, besides in the studio.

Technical Details.

" Get in your pictures that quality which is called atmosphere, making your figures and heads appear to stand out from the back-ground. Do not put your sitters very near the latter, and study every day the effect of different colors, draperies, materials for costumes, what will photograph well or ill, and do so under widely different conditions of light. Remember too, that the seasons have an influence on your work, the strength or power of light varies with them, and while the idea is pretty well exploded that absolute sunlight is requisite for portrait work, it is not usually known that the softest and most evenly lit portraits can be taken during a rain, or when snow has fallen. In the latter case, a short exposure must be given. The ordinary portrait plate-holder holds but one plate, and I prefer when making a specially important picture to use my ordinary view camera, for which the portrait lens is too heavy, without the tripod, and fastening it on a rising and falling stand, as it carries a double holder, and I can thus have several in readiness. This often saves a good picture, for the sitter has no time to get tired or you grow nervous, changing plates.

" Camera work is hard work," said Miss Barnes in concluding, " but to use a current Americanism, ' it pays,' and any woman who makes it a profession must put herself into it, and her very best self at that. Emerson says you will never bring back from a journey any more than you take away, and Joubert says you will find poetry nowhere, unless you bring it with you. So, in photography, you will get back all you put into it of mental study, thought and care, but it will not give something for nothing."

[*From Journal of Photographic Society of India.*]

THIO-CARBAMIDE REVERSALS.

By Col. J. Waterhouse, B. S. C., *Calcutta.**

Till lately I have not been able to make much progress in working out the direct positive process with the thio-carbamides since the warm weather in September and October. However, on taking it up again in cooler weather, it was found that better results were more easily obtained, and I am glad to say that some new experiments seem to have brought me within reach of a practical method, though much has yet to be done to work it out and perfect it.

The principal difficulty all through has been to secure clear lights with good detail in the shadows. If the high lights are clear, the shadows are too deep, and if the shadows are clear and well detailed, the high lights are liable to be overdone and unreversed. This is particularly the case in outdoor work, with sky and dark foregrounds. It was evident that something was wanted, which would more completely reconvert the reduced silver in the more exposed parts into silver haloid salt, so that it might be dissolved out by the fixing agent. This I found could partly be secured by prolonging the development and allowing the reversing agent plenty of time to act

* With compliments of author.

and complete the reversal. The image thus produced may be too dense for printing purposes, but can be reduced, after fixing, with bromide or chloride of copper, or other suitable reducing agent, so as to gradually bring down the lights and details till they are sufficiently clear, though the operation has to be conducted with some care in order to prevent uneven reduction. A preliminary treatment of the plate with dilute hydro-bromic acid was tried, but was not found better than the dilute nitric acid previously used with advantage.

In a leading article on the process which appeared in the *British Journal of Photography* for October 24th, attention was drawn to a curious compound of thio-carbamide and ammonium bromide, which was first described by Professor J. Emerson Reynolds in a paper published in the *Journal of the Chemical Society*, of London, for 1888, and to which he gave the name *tetrathiocarbamide ammoniumbromide*. This salt is quite easily prepared from thio-carbamide, and a trial of it has given me some very good results, better in many respects than those obtained with other thio-carbamides. It acted in every way much better than the plain thio-carbamide, which I found rather unmanageable, from the exceedingly short exposures required, with only very minute quantities of the salt in the developer.

Professor Reynolds's instructions for preparing the new salt are to dissolve one part of ammonium bromide in as small a quantity of alcohol as possible, and add it to a nearly saturated boiling solution in alcohol of 3.04 parts of pure thio-carbamide. The boiling is continued for some time afterward and then the flask is allowed to cool. On standing, the contents will be found to set into a mass at the bottom and may be re-dissolved in alcohol for use. I find that about five drops of a strong alcoholic solution of this salt to the ounce of developer are sufficient, but in some cases more may be added during the development.

It is important that the alcohol should be strong, because water decomposes the salt. In making up some of the salt a second time a little water found its way into the flask, and the product seems to work quite differently to the proper compound salt.

It is remarkable with what very short exposures strong vigorous positives can be obtained by the addition of a few drops of the saturated solution of this salt to the eikonogen developer. In a case where the ordinary exposure with pyro-development would have been from sixty to ninety seconds, ten seconds was found to be more than sufficient, and the exposure was actually reduced to two seconds. This enormous shortening of exposure points to what may eventually be one of the most valuable applications of this curious process, and that is to astronomical photography. Already by the use of gelatine dry plates, the photographing of stars, nebulæ, and other heavenly bodies has been greatly facilitated and made to render thoroughly practical service, by the shortening of the long exposures necessary with even the most sensitive wet or dry collodion plates. By a still further large reduction in the time of exposure much more could no doubt be done, the long hours of patient attendance at the photo-telescope finder could be saved, and plates would be obtained which could at once be transferred to copper to be etched and printed. The new process may also prove useful in spectrum photography.

Professor Reynolds has found that thio-sinamine and phenyl-thio-carbamide do not form similar compound salts with ammonium bromide, but I have tried some other bromo compounds of these thio-carbamides, and find that a mixture of bromine and thio-sinamine promises well and gives rich vigorous images with good clear lights and well detailed shadows. I have prepared it by adding equal parts of bromine water and of a saturated solution of thio-sinamine. After a time the solution turns slightly opalescent and cloudy, probably from the precipitation of sulphur. (Dr. G. McGowan has found that excess of bromine causes thio-carbamide to lose its sulphur, and become converted into carbamide.—*Journ. Chem. Soc.*, London 1887.)

I have lately been working with a form of developer which seems to act satisfactorily in the reversing process and is simple.

Eikonogen	5 grains or 1 gram.
Sodium sulphite	5 " " 1 "
Lithium carbonate	5 " " 1 "
Water	1 ounce " 100 cc.

The carbonate of lithia is kept in saturated solution at about one per cent. and the other salts are dissolved in it as required. A paper on lithia and borax developers has long been under preparation, and should have appeared some time ago, but I hope to give it in an early number of the *Journal.*

As both thio-sinamine and thio-carbamide can quite easily be prepared, a few notes on their preparation, from experience, may be useful to any one wishing to try the method, and unable to obtain them in commerce.

To make thio-sinamine. Procure some essential oil of mustard from the chemists, the pure mustard oil is better, but not easily procurable. The common oil contains resinous impurities which are very hard to separate out without redistillation, which is a troublesome process, though they do not seem to interfere with the reversals. Care must be taken in handling this oil, because it gives off unpleasant, strong smelling vapors which are very irritating to the eyes. Having put some of the oil into a stoppered bottle, add to it four to six times its volume of strong solution of ammonia, and leave it for some hours till the oil has been converted into thio-sinamine or taken up as much of the ammonia as it will. The conversion may be hastened by shaking the bottle from time to time, but if the oil is impure it seems better to allow the ammonia to act quietly and not take up the impurities. The solution is then poured into an open vessel, in order to allow the ammonia to evaporate. This must be done out of doors or in an open place, because the smell is very penetrating and unpleasant.

The solution may, if necessary, then be filtered and evaporated down and left to crystallize. Recrystallization once or twice will be necessary if the impure oil has been used, and the crystals can be kept or dissolved as desired. The pure crystals are white and quite inodorous. The impure crystals may be yellowish and have a slight smell.

The preparation of thio-carbamide was first described by the discoverer, Professor J. E. Reynolds, in the *Journal of the Chemical Society* of London for 1869. A quantity of sulpho-cyanide of ammonium is thoroughly dried till it becomes white and almost powdery. When fairly dry it may be pounded up, and the drying completed. It is then put into a flask and heated in an oil bath gradually to about 170 degrees C (338 degrees Fahr.) and kept at that temperature for about two hours, the temperature being regulated by a thermometer introduced into the flask. The sulpho-cyanide melts and gives off vapors, and is gradually transformed into thio-carbamide (sulpho-urea). After sufficient melting, the flask is allowed to cool down to boiling point and a little hot water introduced; the hot solution is rapidly filtered and allowed to crystallize.

The crystals always hold a large quantity of unconverted sulpho-cyanide, which may be removed by re-crystallization and to a great extent by draining out, especially in a damp atmosphere, the thio-carbamide crystals being permanent, while the sulpho-cyanide is deliquescent. Pure thio-carbamide gives no red color with a persalt of iron, but it is difficult to get rid of all traces of the sulpho-cyanide. The crystals take many different forms, partly depending on their purity and other conditions. Sometimes they are in very short fine needles, at others in long needles, or in long, glistening, fibrous, radiating wisps, like asbestos or spun glass; or again in flat, fibrous prisms; the latter form seems to be the purest.

Besides the application to astronomical and spectrum photography already noticed, the new process, if it can be successfully worked in ordinary practice, might prove of use for portraiture in the studio, especially in dull weather or under other circumstances when shortening of exposure might be of advantage. It might also prove serviceable to itinerant photographers, who would thus be able to take transparent positive

portraits which could easily be framed in the style of the sixpenny ferrotypes and delivered, if not on the spot, at any rate in the course of an hour or two, allowing time for washing after fixing. Another application might be to the penny-in-the-slot apparatus, though here again, time would be required for washing away the fixing agent. For reversed negatives and lantern slides it may also be found useful, as well as for a good deal of amateur photography, in which a single positive transparency might really be of more use and better worth keeping than a negative.

Wratten's "ordinary" plates still continue to give me the best results, and the fresher they are the better. There are, no doubt, however, other brands which might work with more certainty. The great difficulty is to get rid of the first-developed negative image, and, if obtainable, something is required which will develop up the positive image at once. From some of the results lately obtained with Professor Reynolds's compound tetrathiocarbamide, I believe that the process is capable of giving perfect transparencies with suitable plates, but in this country these are not easy to get, and one works under very great disadvantages and limitations caused by want of leisure, unfavorable conditions of climate and distance from commercial centres, so I hope that the process may be tried elsewhere with various makes of plates and the results reported.

[*From the British Journal of Photography.*]

HYDROQUINONE IN WINTER USE.

BY W. B. BOLTON.

WHATEVER may be said in favor of hydroquinone—and it has many good points to recommend it—few, I imagine, would specially select it for employment during such weather as has recently been with us, on account of its slowness of action even at the best of times. However, for a particular purpose, a few days ago I reached down my bottle of stock hydroquinone solution for the first time during many weeks, and the lesson I learnt may possibly be of some use to others, and act as a warning to those who are only occasional workers.

The solution is a pretty strong one—very strong for a purely aqueous one—but I use a small proportion of alcohol to assist in dissolving the necessary quantity, and there is also present the usual addition of sodium sulphite. The bottle, I may say, had been standing not in my developing room, but on a shelf in an exposed position in a room in which there had been no fire during the whole period of frost, and had probably been at times exposed to a temperature as low as 26 or 28 degrees Fahr. I mention these circumstances as partly explaining the condition in which I found the contents of the bottle.

It is no unusual occurrence in ordinary weather to find the stock bottles of pyro or hydroquinone, when accompanied by large quantities of sulphite, to show a deposit of crystals; but in this instance I found not only the usual crop of solid crystals at the bottom of the bottle, but in addition the whole volume of solution appeared to be a nearly solid mass of crystalline matter. When the bottle was upturned a small quantity of liquid ran into the neck, leaving a compact network of long needle-shaped crystals closely interlaced, occupying the space previously filled by the solution, and having the appearance of representing a larger quantity of solid matter than should be contained in the full bottle of solution.

From curiosity, more than any other reason, I drained the liquid portion away from the crystals, and these were subsequently shaken out of the bottle into a porcelain dish—at least the needle-shaped ones—the solid layer at the bottom being left *in situ*. They were dried at a gentle heat, applied for three or four hours, and then weighed. In appearance they had the characteristics of pure hydroquinone, but the weight, representing more than three-quarters of the total quantity of that substance that should have been present in the volume of solution, seemed to point to their being

mixed with a considerable proportion of sulphite of soda. As the readiest means of forming an approximate estimate of the true quantity of hydroquinone, a weighed portion was heated on a piece of platinum foil (also previously weighed), with a view of ascertaining by the residue left after volatilization of the hydroquinone how much sulphite was present on the weighed sample. After heating carefully for some time, the foil never being allowed to approach redness, the whole quantity practically was volatilized, for all that remained formed scarcely more than a stain on the platinum, proving that the crystals were practically pure hydroquinone.

There was no doubt as to the absolute dryness of the crystals before performing this last experiment, as I took means when drying to test for loss of weight, and when this had ceased for some time it was fair to assume that all the moisture had been driven off. As hydroquinone contains no water of crystallization, and, so far as I am aware, cannot be made to form hydrated crystals, it follows that the effect of the intense cold had been to eliminate upwards of three-quarters of the hydroquinone from the solution; and at the same time there was little, if any, more deposit of sulphite than I should have expected to see under less severe cold. Consequently the developing power of the solution—that portion of it that remained liquid—may be better imagined than described, weak as it would be in developing agent and proportionately overcharged with sulphite.

The moral of this is, that hydroquinone, from its comparative insolubility in water as compared with pyro, requires far more careful watching in the colder months of the year than other developers. Pyro solution under nearly the same critical conditions exhibited no abnormal behavior, the solution being so far removed from the point of saturation that, short of absolute congelation of the whole liquid, the intensest cold would produce no effect. Saturated solutions of ferrous sulphate and potassic oxalate, or their solutions as kept for oxalate development closely approaching saturation, would no doubt under similar climatic conditions produce grave uncertainty unless carefully examined, but, I venture to think, nothing approaching hydroquinone.

But there is another point of view from which the matter may be looked at. Hydroquinone dissolves very slowly in water at the ordinary temperature, heat being absolutely necessary to get any reasonable quantity into solution in a moderate time. It is probable, therefore, that many weeks or months of "thaw" would have been necessary to bring that solution into its normal condition, if it ever resumed it without being artifically heated, and that I greatly doubt; so that in the hands of a careless worker there is no guessing how many plates would have been spoilt, and how many plate-makers would have been condemned for issuing films with a false character for sensitiveness and other qualities.

Such an extreme case as I have related could perhaps scarcely occur in a laboratory in constant use, or that was kept properly warmed; but, as I have explained, my bottle had been on the ordinary chemical shelves in a cold room seldom used. The incident may, however, serve as a warning, and emphasize recent advice as to the necessity for properly warming the developing room.

DAGUERRE MEMORIAL.

To the Editors of the BULLETIN :

It is nearly one year since the beautiful memorial of Daguerre was placed in its honored position in the Smithsonian Institute at Washington. The committee in charge used their best judgment in selecting the design, and although there was some caviling, as is always the case where a large number are to be satisfied, it was universally conceded to be a beautiful work of art, a fitting memorial to the founder of photography.

The money was to be raised by subscription, and a goodly sum was realized,

but there still remains a large deficit due the designer, which, if not made up by individual subscription before the Buffalo Convention, must be paid from the treasury of the Photographers' Association.

This is an appeal to all who have not as yet sent in their subscription to do so at once, that the indebtedness may be considerably lessened before our next meeting in July. Do we not all take a personal interest and pride in seeing one who has done so much for the art which we love, honored in a fitting manner, and are we not one and all ready to do our share, small though it may be, in meeting expenses necessarily incurred?

There has been about $3,300 paid to the sculptor; about $250 was subscribed that has not been paid, so there still remains nearly $2,500 to be raised to settle the indebtedness. As per vote of the association at the Washington Convention, the committee are to use every means to secure the balance due, and after all efforts have been exhausted, the balance must then be paid from the treasury. The committee can not but feel that contributions will be forthcoming, although the present outlook is rather dismal.

If you have not already subscribed for this testimonial to our honored Daguerre, kindly remit to H. McMichael, No. 426 Main street, Buffalo, N. Y., any amount from $1 upward that you can spare, for this most worthy memorial to one who laid the foundation for our success.

GEO. H. HASTINGS, *President P. A. of A.*

OUR ILLUSTRATION.

SOME time ago we gave our readers an example of the work of Mr. W. E. Hook, of Manitou Springs, Colo. Those pictures were from a series of negatives made on Anthony's climax films, and formed an interesting set of illustrations. With this issue of the BULLETIN we give an example from a second series of negatives made on the same kind of films. It is not necessary for us to speak of the beauty of the results, they tell their own story. For such mountain photography the film negative is by far the best means of securing fine views. The great reduction of weight is a consideration that is of paramount importance under such circumstances, and when the results are as good as the picture presented with this issue of the journal we believe that the use of glass plates is not to be thought of for photography in mountain regions.

PHOTOGRAPHY AND THE RAINBOW.

Prof. LANGLEY, of the Smithsonian Institute, has recently made some remarkable discoveries regarding ultra-red and ultra-violet, which are invisible to the naked eye, but which were brought out in the recent colored photographs of Lappmann. The ultra-red is to the left of the red in the rainbow, while the ultra-violet is to the right of the violet in the rainbow, so that the rainbow is considerably added to in both directions. Prof. Lappmann states that the roses and other flowers owe much of the beauty of their coloring to these two invisible colors. By an instrument of his own invention, which is inexpressibly delicate, and which he calls a "bolometer," the professor increases the rainbow to more than twice its visible length. This contrivance, which is a thin film of iron, through which a current of electricity is passed, is moved along over a rainbow cast by the sun through a prism, registering the heat of the hidden rays by the interruption of the current. In this way it is clearly shown that we are actually able to see but a small fraction of the rainbow.

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E. & H. T. ANTHONY & CO., Publishers.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held on Wednesday evening, April 8, 1891, the *President*, Mr. JOHN G. BULLOCK, in the chair.

The election of the following active members was announced : Joseph T. Rothrock, S. Ashton Hand and Louis Taws.

The Board of Directors presented their annual report, covering the period since January 1, 1890.

During this time the following papers had been read before the society : "On the Dangers of Flash-Light Compounds," by John G. Bullock and Dr. Charles L. Mitchell ; "The Silver Printing Bath," by Dr. C. L. Mitchell; "Gelatine Emulsions," by William Bell ; "Heliochromy," by F. E. Ives ; "Intensification," by Dr. C. L. Mitchell ; "West African Eclipse Expedition," by John Carbutt, Jr.; "Notes upon a European Trip," by John Carbutt. Discussions were also held upon the following subjects : "Shutters," "The Optical Lantern," and "Dark-Room Illumination."

A marked increase of interest in lantern matters had taken place; two succcessful public lantern exhibitions had been given at Association Hall, and six complimentary to members and their friends, at the Franklin Institute and at the rooms of the society.

An exhibition of photographs by Mr. H. P. Robinson had been held in the society's rooms; also a display of the work of members, from which the annual honor pictures for 1890 had been selected.

The total active and life members, March 31, 1891, was 202.

The Treasurer's annual report showed a balance on hand of $1,278.62.

The election of officers for 1891–92, resulted as follows: *President*, JOHN G. BULLOCK; *Vice-Presidents*, JOSEPH H. BURROUGHS, EDMUND STIRLING; *Secretary*, ROBERT S. REDFIELD; *Treasurer*, SAMUEL M. FOX; *Directors*, John C. Browne, Charles L. Mitchell, John Carbutt, George Vaux, Jr., William H. Rau, Frederic E. Ives, Samuel Sartain, George M. Taylor.

The Secretary exhibited a new shutter, the invention of Mr. H. B. Morton, of Minneapolis, known as "The Cloud Catcher." The shutter was of the rotary form, attached to the hood of the lens. The opening in the leaf was of a peculiar shape, allowing full exposure to the foreground and landscape, with considerably less for the sky or distance. The shape and size of the opening could be readily changed to suit the character of the view or intensity of the light.

A modification of the Kodak camera was shown, being the contrivance of Mr. S. Ashton Hand, by which the roll-holder could be removed and five double holders put in its place. A ground-glass screen was also provided, which enabled the operator to properly focus a view, as with an ordinary camera. An acid fixing bath in solid form, in the shape of a powder to be dissolved as required, and also a portable developing powder, to which the name of "Phainogen" had been given, were shown. Both the above were prepared for the market by Dr. Mitchell.

Dr. Mitchell stated that, as the subject announced for discussion was "New Developers," he would start the ball rolling. There had been a great deal of discussion among members of the societies here and in all scientific journals, during the past five or six years, relative to the merits of eikonogen, pyro, hydroquinone, and a combination of these different ingredients. He desired particularly to call their attention to an article in "Photography," dated March 19, 1891, entitled: "A Series of Experiments on Mixed Developers, and on the Result of Using One

Developer after Another." In summarizing that article he believed that the two best results were obtained by first developing the negative in pyro, and then following with a solution of eikonogen; and secondly, by developing the negative with hydroquinone, and then following with eikonogen. The doctor explained one of the methods of experiment taken by the writer of the article in question. A negative developed in hydroquinone had been placed half-way down in a dipping bath filled with eikonogen developer, the result being that the half which had been immersed in the eikonogen was very good, the hydroquinone half harsh and poor. He had found that the same effect occurred by using eikonogen after pyro, although from the general tenor of the article it would appear that the experimentalist thought the hydroquinone and eikonogen treatment a little the best. There was very little difference, however, between the two.

The experiments were fully detailed in the paper, and he (the doctor) would recommend the members of the society to investigate the whole subject, and make a study of the article, as it was decidedly worth reading. The members were, very probably, familiar with the different forms of dry developers now being put up. In fact, judging from the number of new developers now being placed on the chemical market, he thought the next few years would lead to a marked advance in the way of developing agents, and probably pyro, perhaps hydroquinone, would be placed on a back shelf.

Mr. Carbutt said that he had come to the conclusion that, at the present time, a mixture of hydroquinone and eikonogen was the best developer of the day. The two combined—using about two of eikonogen to one of hydroquinone—would give a developer containing the good qualities of both.

Considerable discussion arose at this point in regard to the merits of exposure meters, in particular the Watkins exposure meter.

Mr. Carbutt said he had received one of the Watkins meters, but had not as yet had sufficient experience with it to speak positively in regard to it. It looked, however, as though it would be a very satisfactory instrument.

Mr. Charles R. Pancoast, President of the Waterbury Photographic Society, said that he had not expected to make any remarks that evening, but he would like to know if any of the members had ever used an exposure meter on an extended trip, taking all kinds of weather and times of year. He thought it was a very interesting subject, and of importance to know just how much time to expose a plate. Last spring, about the middle of April, he made an exposure of Carbutt's B 20 plates, with a Dallmeyer rapid rectilinear lens, stop *f*-32, and two or three seconds was amply sufficient for a fine negative. Taking these same plates in June, when one would presume the actinic power to be greater, five or six seconds was hardly enough. He mentioned one or two more cases where this difference had occurred, and said he would like to know whether these exposure meters would give the correct exposures, or approximately correct.

Dr. Mitchell said the only one of any real scientific value he knew of was the one Mr. Carbutt had just mentioned—the Watkins exposure meter—and he expected to give it a very careful test. Most of the others were conducted on the plan of placing the meter against the ground glass and observing the amount of light, which was rather an unsatisfactory way of judging. He then described in detail the various parts and purposes of the Watkins meter.

Referring to Mr. Pancoast's experiences, Dr. Mitchell said that on a very bright day he had often found little actinic power, while on other days, probably overcast, he had found the light act upon his plates very quickly.

Mr. Pancoast asked whether—supposing he desired to expose a plate in a southern latitude, or in this latitude in June, with the sun directly overhead at noon, and he sought to get detail, especially in foliage—this instrument would make any allowance for that, or would it be necessary to make one's own allowance.

Dr. Mitchell replied that the operator would probably have to make his own allowance. However, he was not yet sufficiently familiar with the instrument to say.

Mr. Coates asked whether it was not possible for the makers of plates to come together and agree upon some common basis for designation of the sensitiveness of plates, so that the numbers would always mean the same thing.

Mr. Carbutt thought it would be a very good thing to do.

Mr. Coates stated that in his opinion it was very important that makers should agree upon some uniform basis. As it was, one maker's sensitometer 40 was about equivalent to some other person's 30.

Mr. Earle suggested to Mr. Coates that he express his opinion in the form of a motion,

or a sort of "round robin," to be sent to the various photographic societies throughout the country, to see what they thought about it and see if the makers could not be brought together.

Mr. Stirling inquired whether any effort had ever been made to get manufacturers together to consider the subject of uniformity in the method of numbering.

Mr. Carbutt said there had not, to his knowledge.

Dr. Mitchell said it seemed to him the only way to attain the desired uniformity would be —pressure; and he thought if this thing was presented in the right way, and through the different societies of the country, it would carry an amount of weight that would influence the action of the plate-makers of this country. It only depended upon placing it before them in such a way as to make it appear to their interest to do what was required of them.

After considerable discussion, Mr. Stirling moved that a special committee be appointed by the President to take into consideration the feasibility of starting a movement looking to a uniform method of marking plates, the committee to report to the society, which was carried.

Mr. Chapman narrated an experience he had had with some pyro developer, which he had left in the sunlight with the stopper out. The sun turned the solution to port wine color. It was a single solution developer, but with it he could build up to any depth without fog, and get dense black negatives on instantaneous exposures. He had not been able to do such work with fresh pyro, kept from the light, or with old pyro with fresh solution added to it. He used it for six months or more, and always got powerful negatives from instantaneous exposures.

Mr. Julius F. Sachse read a paper entitled: "A Suggestion for a Possible Method of Identifying the Colors Photographed." See page 271.

Various prints illustrating his experiments, also a few lantern slides, were exhibited to the members by Mr. Sachse.

Dr. Skinner, an eminent entomologist, who was present, said that this would undoubtedly have great scientific value. The trouble with the present method was that it precluded the possibility of illustrating a great many natural history objects on account of the great expense. The larger and showier species of insects had been illustrated, but the great majority had not, especially in this country. It was a great desideratum to have these things illustrated, because, of course, numerous discussions were had on them, but it was very laborious to attempt to make anything out from these discussions without having colored illustrations, or illustrations showing what the colors might be. They could see at a glance the advantages that would accrue from this new method, when it would take anywhere from an hour to a week to hunt up from numerous descriptions the color values of an object under discussion. The present method on stone was very expensive, took a great deal of time, besides requiring the services of an artist to make drawings, and then the lithographic work, the printing and finally the coloring by hand. He sincerely hoped that some method of the kind outlined by Mr. Sachse would become successful.

Mr. Carbutt said that the method of illustrating books now by the half-tone process had reached such a state of perfection that he thought, with the aid of orthochromatic photography, it should be possible to make the illustrations for scientific works, with color patches at the foot of each, made to match the color of the object, and using the same as a key, as successfully represented by Mr. Sachse. This would save all the research and description of the colors of the objects. He thought it would be of great value, because a person could by its means carry in his eye (having the key below), the color the bird or fly might possess.

The chairman inquired if Mr. Sachse knew whether the sample tissue colors shown were aniline colors or not. Some of these colors were very fugitive.

Mr. Sachse said he could not answer that question. He had used these tissue colors, on the spur of the moment, as the best set of colors he could get. Of course he would try to match the colors exactly—probably by the use of water colors—but the examples he had used were merely ordinary commercial samples of tissue paper, the best he could get.

Mr. Cheyney asked whether it would not be possible to flow orthochromatic plates with a stained soluble gelatine, which would act as a color screen, and thus avoid the necessity of carrying screens to be placed in front of the lens.

Mr. Carbutt said he could only answer that in a theoretical way. He had never tried the experiment, yet did not see why it should not answer. The disadvantages would be, however, that one would be compelled to use the fixed plate as it was, while under the present conditions he could use the plate with

or without screen, or vary it from the light yellow to the orange, as he desired. This, he thought, was the better plan.

Adjourned. ROBERT S. REDFIELD, *Secretary.*

CALIFORNIA CAMERA CLUB.

THE Club on April 17th gave a lantern exhibition and lecture, entitled "Glimpses of Ireland." Before 8 o'clock every seat in the house was occupied, besides many standing in the various isles. The lantern was admirably managed, and the audience constantly applauded as the beautiful views were presented on the canvas. Dr. C. H. Steele was the lecturer of the evening, and conducted his hearers through the picturesque portions of Ireland, punctuating his description of the various places with appropriate anecdote or poetic quotations. The views commenced at Dublin and the places of interest in the vicinity, Vale of Shanganah, and the scenes in the County of Wicklow, with the beautiful Vale of Avoca. Round tower of Kildare, Kilkenny, with a description of the famous cats. The Rock of Cashel, Holy Cross Abbey and the City of Cork, with the Shandon Steeple and the Black Rock Castle. Queenstown and the residence of Sir Walter Raleigh, who introduced the potato from America to Ireland. Blarney Castle, with the famous stone, the tunnel from Cook to Kerry, Killarney, with its lakes and scenery; County Down, Armagh, Belfast and places of interest in its vicinity, Antrim with Shane's Castle, Garron Tower, the Rope Bridge, Giant's Causeway. Dunlace Castle, Londonderry Cathedral, Natural Bridge of Ross, Galway, Rapids of the Shannon, Limerick, Battle of the Boyne and the Treaty Stone of Limerick. The musical selections were "Killarney." by Miss Ewer; "Tin Whistles," by Bornemann and Sieberst; selections by the Elturia on mandolins and guitars. These lantern exhibitions are becoming very popular, and there is hardly a hall in the city large enough to accommodate the persons anxious to attend them.

BOSTON CAMERA CLUB.

THE Boston Camera Club have decided to hold an exhibition and sale of the photographic work of members, beginning on May 11th and continuing two weeks.

Specimens of members' work are to be hung in the rooms, from which orders can be taken. An attendant will be present daily from 10 A.M. until 5 P.M. to take orders. The entire proceeds are for the benefit of the club.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—A Subscriber writes: In focusing subjects upon ground glass under my skylight the face and clothes seem to have a very gritty or sandy appearance which shows on the negative and spoils the effect of the photograph. Enclosed find proofs.

A.—This grain-like appearance of the negative is due to the use of a developer that is too warm, or to the use of a fixing bath containing alum. The remedy is the use of ice in the developer, and if the fixing bath has alum in it use a smaller quantity. Too strong a developer will also produce the same effect.

Q.—H. N. H. writes: Please give me through the columns of the BULLETIN a formula for intensifying weak negatives and one for reducing them, and oblige.

A.—Make a saturated solution of corrosive sublimate, and mix one volume of this solution with six or eight volumes of water. Place the negative in this bath and allow it to remain till it begins to appear white on the back; that is, it will look gray. Now remove it, wash in water, and place it in a saturated solution of sodium sulphite. The weak image will become denser, and after washing thoroughly is a permanent color. For reducing, place the negative in an ordinary hypo bath to which a few drops of a solution (40 grains to the ounce) of red prussiate of potash has been added. The amount of prussiate in the bath will determine the amount of reduction. Wash well after reducing.

Q.—J. T. D. writes: Will you kindly answer the following in the pages of the BULLETIN? I have a 5 x 8 camera of ordinary type, and expect to get a better lens. What I wish to know is, would a lens of reliable make, as advertised, for 6½ x 8½ plates, work well with my camera, *i. e.*, would the image be proportionately reduced, so as to just fill a 5 x 8 plate, when properly focused, or would a portion be left out? My idea was to get a lens that would usually be used for 5 x 8 plates, and on occasion might be used for 6½ x 8½ pictures—landscapes especially.

A.—Your lens that will cover a 6½ x 8½ plate will more than cover a 5 x 8 plate. That

is to say, the image will be larger than the one given by the lens used on the 5 x 8 plate. But, as a rule, the lens of a 5 x 8 camera will cover a 6½ x 8½ plate if it is stopped down with a small diaphragm. With the larger lens the focus will be longer; you must therefore see that the bed of your camera will draw out 2 or 3 inches further.

Views Caught with the Drop Shutter.

THE STANDARD PHOTOGRAVURE COMPANY has been incorporated in Chicago to do a general photogravure business. The capital is $2,500, and the incorporators are H. B. King, E. C. Miles and others.

THE death of MR. DARIUS GOFF, of Pawtucket, R. I., occurred Tuesday, April 14th, at the age of eighty-two years. Mr. Goff was a Director of The Blair Camera Company, and its President from 1882 to 1885, when he resigned in favor of his son, D. L. Goff, who now fills that position. He was one of Rhode Island's most prominent and staunch business men, being President of several large corporations and a Director in several others, including banks, and a Republican of the old school. His sons maintain the same political faith; Lyman B. Goff was one of the two receiving the Republican nomination for the Lieutenant-Governor of Rhode Island for the present year, but declining to serve owing to his aversion to politics. Mr. Goff was one of T. H. Blair's financial supporters at the commencement of his enterprises, and his calm wisdom has done much to shape the policy of The Blair Camera Company. He will be greatly missed by his State, city, and many old and young friends who had in him a kind and wise adviser.

Mr. W. H. JACKSON, the well known landscape photographer of Denver, has recently made a change in his firm by placing the business on a corporate basis. Messrs. Chain & Hardy, the former partners in the firm of W. H. Jackson & Co., have been bought out, and the W. H. JACKSON PHOTOGRAPH & PUBLISHING COMPANY, a close corporation has been formed with a fully paid up capital stock of $30,000.00. Mr. Jackson is President of the Company; and, as heretofore, is the head and front of the concern. Mr. Horace A. Bird, formerly General Agent of the Passenger Department of the Colorado Midland Railway, is the Secretary and Treasurer. The new Company proposes to extend their view business quite materially; and Mr. Jackson's excellent work will soon be on sale in all the principal cities of the country. Mr. W. H. Jackson, of Denver, has recently returned from a tour through Mexico, where he made about six hundred negatives of the best scenery Mexico affords; and of the most interesting characteristic Mexican views. He was delightfully surprised with the scenery of the country, which he pronounces quite equal to the grandest and best in the Rocky Mountains; and he confidently expects some of his panoramic views (for which he is noted) will create a stir.

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MADE WITH SINGLE ACHROMATIC DALLMEYER LENS.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

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SUMMER DIFFICULTIES IN PHOTOGRAPHIC PRACTICE.

WITH the advent of warm weather we have a number of questions sent to us, that indicate that those who send them have not taken into consideration the changes that are silently but surely taking place in the circumstances under which they are working. The same class of workers meet another set of difficulties in winter, and from the same want of thought in the matter of noting changes in the power of the light and the variation of temperature.

In the early spring days the mist and cloudiness of winter pass away, and with their passage the light rapidly becomes more and more actinic. This is due to the fact that the fog and mist of winter-time take out of the sun's rays many of those radiations that are of most value to the photographic worker. Yet another consideration is the fact that the solar rays are not so actinic in winter because they do not come to us at the same angle that they do in summer. These two circumstances coming together cause the unwary photographer to over-expose his plates, especially if he is a beginner in the art. To those who are troubled with thin negatives we would recommend attention to this point of increase of the actinic power of the light, and the use of smaller diaphragms.

Another difficulty that we are asked to give a remedy for is dense films in development. This is due to the use of too active developers. During the winter we have to use a somewhat stronger developer than we do in summer, partly to overcome the lack of light effect on our plates, but most of all to overcome the want of activity in the developer from the low temperature of the season. In summer we can dilute these developers and still have them active enough for the production of good negatives. If we use a strong developer in warm weather we shall find that the negative will become too dense before we can obtain sufficient detail in the shadows, while if we use a more dilute solution the development will go on slowly and a much more harmonious negative will be obtained.

With the advent of warm weather we begin to see the production of frilled

films, and are asked if it is not the fault of some particular brand of dry plates. This difficulty is due to the softening of the gelatine from the use of too warm solutions, either in developing or in fixing the negative. It is true that some brands of plates are more liable to show this difficulty than others, but such plates are sometimes more easily worked by the beginner than those having harder films.

For our own use we prefer to work with a soft or rather not too hard film, and we overcome the frilling by the use of a bath of alum and acid or alum and acid-sulphite of sodium. If a hard film is used the plates develop slowly and fix in the same manner. While with moderately soft plates the development is rapidly performed and also the fixing. Yet, another advantage of the softer varieties of dry plates is that the hypo can be washed out much more easily than in the case of the hard brands. A good plan to work with frilling plates is to use a strong developer, and before putting the exposed plate into it, cool the dish with some ice water in which the plate is also allowed to cool for a few minutes, then remove the plate, throw out the water from the dish, add enough ice water to the dish to give the strong developer the right dilution, add the developer itself and replace the plate for development. This method will permit of the working of the softest films when the heat is in the nineties. If the use of ice water is excluded then the alum bath is the best remedy. For such a bath it is best to use a saturated solution of alum to which has been added one-fourth of its volume of water and one-twentieth of a solution of acid sulphite of sodium. This bath serves the double purpose of hardening the film and at the same time removing any stains that may be on it from the developer. It is used before fixing, and requires only a washing of the negative in running water for a few moments before putting into the hypo.

Instead of the acid-sulphite, 1 dram of hydrochloric acid, chemically pure, may be added to 1 quart of the diluted alum bath; but it is not as effective as the sulphite.

If the developer contains potash it is more likely to cause frilling than when soda is used, and, if possible, part of the potash should be exchanged for soda in warm weather. With ferrous oxalate frilling is not so much to be feared as when the alkaline developers are used.

Those of our correspondents who are troubled with the difficulties we have mentioned above should try the remedies suggested, and we are sure that they will have much more comfort in their pursuit of the art.

EDITORIAL NOTES.

We learn from a series of experiments lately carried on by Professor W. K. Burton, that eikonogen may not be kept in solution unless at a uniform temperature of at least 60 degrees, he having demonstrated that at lower temperatures it will invariably throw down a precipitate. A 1 per cent. solution will form a precipitate at freezing point or slightly above; a $1\frac{1}{2}$ per cent. solution will do the same at 42 degrees, and even a 3 per cent. solution will at 53 degrees. These facts are well worth knowing by the many workers in this comparatively new agent.

We note with much pleasure that our friend and neighbor, Mr. John E. Dumont, of Rochester, was awarded a gold medal at the recent exhibition of

the Photographic Society of India at Calcutta. The picture on which this medal was awarded was "Listening to the Birds."

At the regular April meeting of the Photographic Society of Waterbury a large and interesting collection of lantern slides was shown, which was made up of a variety of subjects from different localities.

The following method is recommended for obtaining a glacé finish on albumen prints without the aid of gelatine. A glass plate is coated with a mixture of ox gall and alcohol in equal parts, which has first been allowed to stand for several days with repeated shakings, and finally filtered. The washed albumen print is then placed in contact and squeegeed down, and after drying for about an hour will come off with a beautiful glazed surface.

If the print is to be mounted and the gloss retained, it should be covered as soon as transferred to the glass, with a sheet of parchment paper somewhat larger than the print, previously coated with starch paste, and then treated on the back with a good coat of gum or dextrine. It may then, when dry and removed from the glass, be placed in contact with a moistened cardboard and subjected to pressure.

A new camera club has been formed in connection with the Wagner Free Institute of Science of Philadelphia, with the following list of officers: President, Thomas L. Montgomery; Vice-President, Dr. T. P. Gittens; Secretary, William S. Sword, and Treasurer, R. P. Sword.

The Cincinnati Camera Club has elected the following officers for the present year: President, T. B. Collier; Vice-President, Arthur L. Fogg; Recording Secretary, E. E. Shipley; Corresponding Secretary, H. C. Fithian; Treasurer, M. A. High.

An effort is on foot to establish a camera club in Springfield, Ill., which will doubtless result in its early organization.

Many experiments have been made with a view to the substitution of celluloid film for glass plates for lantern slides, but the inherent color and curling tendency, added to the difficulty of keeping clean, have so far been very heavy difficulties to overcome.

The Albany Camera Club have recently filed their Certificate of Incorporation, the object being the promotion of the art of photography. The Trustees for the first year, who are also the incorporators, are: William W. Byington, Thomas S. Wiles, John S. Patterson, Karl J. Phisterer, Robert Lenox Banks, Jr., Dr. Samuel B. Ward, J. S. Van Buren, M. H. Rochester, Charles L. Palmer, Charles S. Pease, Robert Shaw Oliver, Howard Van Renssalaer and S. C. Leutze.

The *Photographic News*, for many years edited by Mr. Thomas Bolas, and recently by W. H. Harrison, has now passed to the editorial care of Mr. T. C. Hepworth, F.C.S.

THE following platinum toning bath is recommended by M. Brunel Paul, who claims for it stability and efficacy:

Chloroplatinite of soda	2 parts.
Chloride of sodium	2 "
Bitartarate of soda	1 part.

dissolved in

Water	1,000 parts.

The prints, after washing, should be immersed at once in this bath, when they will first assume purple tones, then purple-brown, and finally India black. After toning, treat with hypo bath, 1 to 5, and thoroughly wash.

AT a recent slide exhibition by the New York Camera Club, a feature of the evening was the exhibition of a slide made from a large photograph which was under the Mediterranean for more than a week in the trunk of Mr. W. T. Colbron, who was the only surviving cabin passenger on the ill-fated *Utopia*, which was sunk in the harbor of Gibraltar in March. The original scarcely shows any trace of its long immersion in salt water.

FOR lantern slides on which it is desired to draw with pencil, the following preparation is said to give excellent results. The glass is coated with a mat varnish composed of:

Ether	50 parts;
Sandarac	1 part.
Mastic	1 "
Benzine	10 parts.

After the drawing is made it should be flowed with:

Ether	100 parts.
Sandarac	3 "
Mastic	3 "

which, when dry, will produce a perfectly smooth and transparent surface.

AN international photographic exhibition is announced for September, to be held in Glasgow, under the auspicies of the Glasgow and West of Scotland Amateur Photographic Association, which will be open to professional and amateur talent, and which promises to be of much interest and benefit. Information may be had by addressing Mr. William Goodwin, Honorary Secretary, 3 Lynedock street, Glasgow.

THE third international exhibition of work appertaining to photography is announced for July to September, under the patronage of the Belgian Association of Photography, at Brussels. Circulars and information may be had of Ch. Puttemans, Secretary, Ecole Industrielle, Boulevard du Hainaui, Brussels.

THE long mooted subject of photography by telegraph has made another advance in the experiments of a Western inventor, who claims to be able to reproduce in a series of light or heavily shaded lines, a negative, which may be located at any distance away but connected by telegraph. A stock company has been formed for the prosecution of the invention, and we may soon look for further developments.

We understand that Mr. Childs, of Newport, R. I., has patented a panoramic view camera, which he has constructed in such a manner as to sweep the entire horizon, producing a continuous negative, 16 inches wide and 8 feet in length. The principle adopted consists in causing a wide angle lens to revolve about a drum, on which is stretched the film.

The *Photo American Review*, the official organ of the American Photographic Conference and the Society of Amateur Photographers of New York, has just made its appearance for May, and comes forth in a garb which is extremely tasty and effective. Its contents do credit to the publishers, who have produced a much more valuable journal than their modest assertions would have led one to expect. We offer them our welcome to the field of photographic literature.

A new light sensitive iron compound has been brought to light, which it is claimed will produce a latent image by exposure of one second to ordinary gas-light. This latent image may then be developed in ferrous oxalate and fixed in hypo.

Plans are now nearly completed for the forthcoming Photographic Conference, which promises to be full of interest to the fraternity. A number of papers are promised on topics of live interest, and the names of the writers are ample earnest that they will be well treated.

The Fourth Annual Joint Exhibition of the Boston, Philadelphia and New York societies is down for the 25th inst., and great expectations are being indulged in by the officers and friends of the clubs.

A new camera club has been formed in Somerville, Mass., with the following officers : President, Mr. W. F. Flint ; Vice-President, A. C. Holt ; Secretary, P. M. Harwood ; Treasurer, B. R. Twombly. Business meetings are announced for the first Monday evenings of each month except July, August and September.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Formula for Slow Eoside-Silver Plates.—The Choice of Lenses for Amateurs.—The Cause of Silver Fog and its Remedies.—Triumph of American Photography in Germany.

Dr. Zettnow has published lately a formula to make eoside of silver plates. Thirty grams nitrate of silver are dissolved in 210 grams of water, acidified with 5 drops of nitric acid, and the warm solution of about 50 to 60 degrees C. is poured into just as warm a solution of 24 grams of bromide of potassium in 120 grams water and 9 grams well soaked gelatine. After thorough shaking this is put into boiling water for half an hour, then poured into 20 grams soaked and melted gelatine, and after cooling and shredding washed for eight hours in ordinary and for twenty-four hours in distilled water, changed five times during that period. The emulsion weighed after that 810 grams and showed 13 degrees on the sensitometer ; before pouring it out it received an addition of 16 grams gelatine, 50 grams

alcohol, and so much water that the total weight came to 1,100 grams. After filtering it was mixed with 30 milligrams nitrate of silver and colored with 1 to 15,000 of erythrosin-silver dissolved in ammonia; 11 c.c. were poured upon the plates of 13 x 18 inches. Eight weeks after the setting the plates were developed and appeared completely free from fog; they kept well from three to four weeks during a trip to Switzerland, after which time they began to fog with the exception of those parts which had been covered by the mats or cardboard. The packing consisted simply of black paper, wrapped from five to six times around them. The time of exposure with diaphragm *f*-30 on open landscapes was mostly from one and a half to two seconds; the exposure on a dark foreground, for instance pine and fir trees, was from four to eight seconds, while for the distance it was only a quarter to half a second. According to *Miethe's Photographic Weekly* a diaphragm opening of *f*-13 to *f*-16 is sufficient in summer for instantaneous pictures of one fifteenth of a second in the sun. For opening *f*-30 as applied by Zettnow, a quarter of a second would be sufficient for plates of ordinary sensitiveness, but as he exposes from a quarter to two seconds, it shows that his plates are from six to eight times less sensitive than the average silver eosin plates in the market (Perutz, Anthony) which are used for portraiture.

The most important point in the selection of photographic apparatus is the lens, as is well known. Professional photographers buy generally the best, without regard to price. Amateurs want everything very cheap, and it is surprising that an apparatus is sold here which costs only one-third of a dollar, and pretty good pictures have been made with the same. But the amateur is easily satisfied. Many make only an experimental attempt. If they are successful they will continue; but if unsuccessful they lose patience—they throw the apparatus into the corner and quit. Only a small part, who are not so easily frightened, continue in the cultivation of the art and extend the stock of their apparatus from time to time. This, of course, makes photography an expensive enjoyment, including the price of plates, etc.; but some of the amateurs learn pretty soon how to arrange matters to their advantage. I am acquainted with an architect who superintends a good many buildings at the same time. Formerly he photographed only when on a pleasure trip. Now he has instructed his people to furnish him photographs about the progress of the buildings he erects in the different cities every week. Thus he has a full control of all his buildings, interior as well as exterior.

What lenses are now the best to recommend to amateurs? This question I have been asked many a time, and I can, as a good average lens for general work, recommend the one whose focus is equal to the length of the plate for which the same is intended, thus covering the plate fully from edge to edge, and which has an opening equal to one-sixth to one-seventh of the focus. Such a lens will of course give only a moderate angle (angle of view 60 degrees); also only a moderate light power, but with full opening on a bright day sufficient for groups.

We have got to resign a large visual field and sharpness to the edges, if, as in portraiture, light power is wanted; we have got to renounce this, if as in reproductions and architectural views, sharpness to the edges is wanted. We have to take the distortion of straight lines toward the edges into the bargain when cheap lenses are to do the work, which are the most simple, but by no means the best for landscapes.

It is already fortunate, that we possess in the aplanat constructions (rapid rectilinear proportions of the opening to the focus like 1 : 6 to 1 : 7) objectives that meet without diaphragms the requirement of a light power sufficient for dry plates, which cover more than one third of the focal lengths sharply with full opening, and reproduces sharply and without distortion with diaphragms whose diameter is one-fortieth of the focal length, a plate of the same focal length.

The catalogues are generally pretty difficult to understand and the size of plate to be covered is the principal thing to look for.

If an objective is desired of sufficient light power with full opening (therefore opening 1 : 6 to 1 : 8) one should look in the description list for relative opening or proportion of opening to focal length. One may select from these, according to preference for more or less light power and larger visual field.

The light power is so much larger, the smaller denominator of the fractions $\frac{1}{5.6}$, $\frac{1}{6}$, $\frac{1}{7\frac{3}{4}}$. It also is in the proportion of the square of these numbers therefore as $\frac{1}{31.3} : \frac{1}{36} : \frac{1}{56.2}$, is like 11.1 : 10 : 6.4.

In a reversed order to these numbers is the time of exposure. One would therefore, if the first objective demands ten seconds' exposure, require eleven seconds with the second, and nineteen seconds with the third. If the system has been decided upon, the normal plate size should be looked for. Thus one finds for plate size 13 x 18 an objective with a somewhat short focal length 13.8 c.m. $= \frac{7}{9}$ of the plate length, but the shorter the focal length, the larger is the light power, resulting from the somewhat larger visual field.

Dr. E. Vogel published lately an investigation made by him about the cause and removal of the "silver-fog" from gelatine negatives. Gelatine negatives receive frequently, particularly when subjected to longer exposure, a deposit, yellow in its transparency, with a silver glossy shine when looked at from the surface, the so-called "silver-fog," which is apt to be very detrimental to printing. This silver fog originates in the development with iron only, when substances dissolving bromide of silver, like hypo for instance, or larger quantities of bromide of potassium are present.

By the reduction of very diluted nitrate, chloride or bromide of silver solution, the silver, particularly when slowly reduced, is always separated as a more or less strongly glossy silver mirror, while by the reduction of solid bromide of silver, etc., a silver mirror never forms, provided that no means for dissolving bromide of silver was present. One can easily prove this by pouring some oxalate developer into bromide of silver; a flaky black silver will then form. But if oxalate developer is taken which contains hypo, we receive besides the flaky silver precipitate a silver mirror, solidly adhering to the sides of the glass.

By alkaline development (pyro, eikonogen, hydroquinone) the formation of the "silver fog" is also favored by substances dissolving chloride and bromide of silver, like hypo, ammonia, or larger quantities of bromide of potassium.

Silver fogs are always obtained, for instance, if a solution of bromide or chloride of silver in ammonia or hypo is added to the alkaline developer.

But sometimes a "silver fog" will also appear without the presence of hypo

or bromide of potassium, particularly when the developer is old and has been frequently used. Here the sulphite of soda added to the developer for preservation might be the cause. Sulphite of soda, as is well known, dissolves chloride and bromide of silver, even if only in small quantities. At prolonged development small quantities of bromide or chloride of silver will, therefore, he dissolved, which precipitate as a silver mirror.

If the development takes place in porcelain trays, the silver mirror will also form partly on the sides of the tray. That we have here a precipitate of metallic silver with some organic admixtures, can easily be proven if the same is dissolved with a little nitric acid, filtered and mixed with muriatic acid, whereby a distinct precipitate of chloride of silver will be obtained.

For the removal of the silver fog the following can be applied:

First.—The wet negative tanned with alum is rubbed pretty forcibly with the fingers. This is a tedious operation, but without danger to the negative if proper care is taken, and in most cases one is successful in removing the fog completely.

Second.—The negative, immediately after fixing, is placed into the following reducer, without previous washing:

Hyposulphite soda (1:5)	100 c.c.
Red prussiate potassium (1:5)	1-2 "

The "silver fog" will almost always disappear completely in a short time. The negative is then washed for half an hour.

The reducer for this is intentionally much more diluted than the one usually taken for the reduction of negatives.

The "silver fog" being on the surface, as shown by the mechanical possibility of removal, it can be dissolved before the coarse-grained, more imbedded silver particles can be attacked.

American photography celebrates here a triumph in Mr. Muybridge, whose portrait has been published in the *Photographische Mittheilungen.* He is at present at Munich, where he has given an exhibition, and he has met there with the same enthusiastic reception as in Berlin. The royal princes and the first artists and men of science honored his exhibition with their presence.

Berlin, May, 1891.

[*From our Special Correspondent.*]

ENGLISH NOTES.

I am told that my title of "English Notes" has been appropriated by a contributor to another American photographic journal. Surely he might have found some other title—"Anglican Remarks," for instance; or "British Babblings!"

Another great exhibition is over. The Crystal Palace is perhaps the best adapted building in this country for a really immense show of pictures and of apparatus. It must be confessed that the apparatus section was a failure. Most of the large dealers refrained from exhibiting; but I believe that their policy was a mistaken one, and that the firms who were represented will reap the benefit. The collection of pictures was large and excellent. The most prominent feature of the whole show was the second annual competition

for the Fifty Guinea Challenge Cup, offered for competition among the photographic societies of the United Kingdom. This resulted in a second victory for Birmingham; and the B. P. S. has now only to win the cup once more for it to become their absolute property. The regulations were that each society must send in not fewer than fifty, nor more than one hundred pictures. The Birmingham Society's success was largely due to the uniform excellence of their pictures. Mr. Jerome Harrison contributed seventeen pictures out of the hundred which formed the winning set. Among the professionals, Van der Weyde, of London, Winter, of Derby, and Crooke, of Edinburgh, take the lead.

The new collodion dry plates, the invention of Dr. Hill Norris, will be ready for issue in June or July. A factory has been built for their manufacture at Stechford, near Birmingham. Dr. Norris informs me that they can be developed either with silver nitrate in pyro solution or iron, just as the old wet plates were developed; or by the modern alkaline developer. In the former case their speed is that of a wet collodion plate; in the latter of a gelatine plate. I also hear that Mr. J. B. B. Wellington, one of our very best workers, has just succeeded in producing a collodion emulsion, which gives twenty-five on Warnerke's sensitometer; and which is therefore as rapid as any gelatine dry plate. It is possible—nay probable—that the exiled monarch, collodion, will be called to the throne once more, and will resume the sway which he exercised over photography from 1851 to 1880.

The annual conference of the Camera Club was held at the Society of Arts' Rooms, in London, on April 7th and 8th. Captain Abney presided with his usual ability, and in his opening address commented on the importance of adopting a standard international decimal system of weights and measures. This question is to be debated—and we trust settled—at the International Congress at Brussels next August. For plates, a "half-plate" of $6\frac{1}{4} \times 4\frac{1}{2}$ is recommended as the standard; and this would be practically identical with the 26 x 68 centimeter plate, which is the size most used on the continent. We should then have the quarter-plate—$4\frac{1}{2} \times 3\frac{1}{4}$ inches, the "whole-plate" of $9 \times 6\frac{1}{2}$ inches, and then the 13 x 9 inch plate. These are really much better sizes than those now in use which are too broad and squat. This change seems very desirable, for at present travelers are often unable to obtain plates to fit their dark-slides; while the business done by English and American plate-makers is mainly restricted to their own countrymen, although their plates are, confessedly, superior to those of the continental makers.

It is the custom of the Camera Club to annually invite some artist—of more or less distinction, usually less—to deliver himself at the Conference upon the relation of photography to art. Last year this task was fulfilled by Mr. Rossi, who succeeded admirably in showing that his theoretical knowledge of either subject was nil. This year, Mr. Jo. Pennell produced a diatribe against photography, which merely proved that he knew nothing whatever of the use of the camera. To quote a few lines from the paper it seems that Mr. Pennell went to a famous cattle "round-up" in France, and "sketched with all my might what I could sketch, and made snap-shots with my detective camera at the rest. I sent the exposures to London to be developed. I am unphotographic enough to merely pull the string, and the result was six good pictures and thirty-two failures, after nearly two months of waiting." And this is the sort of thing for which Mr. P. blames photography instead of himself!

A very interesting feature of the Conference was the exhibition of some remarkable specimens of allotropic silver, sent over from Philadelphia by Mr. M. Carey Lea, a man of whom Americans ought indeed to be proud. To see pure silver of a brilliant gold color, of a blue color, and of a yellow color, is very surprising. Of course, we have well-known examples in the case of other elements. Oxygen can exist in the ordinary state, or as ozone ; carbon assumes six or seven allotropic forms, as graphite, coke, lamp-black, the diamond, etc. But Mr. Lea's finding that silver is also of a protean nature, is entirely new. Can it be that the latent image consists of allotropic silver?

The "Alpha" printing paper made by the Ilford Company is finding extended favor. It is a slow gelatino-chloride emulsion spread upon paper. It requires about three minutes' exposure when in contact with a negative at six inches distance from an ordinary gas-burner. It is then developed with either ferrous oxalate or hydroquinone, and toned in a sulphocyanide toning-bath. Its great feature is the variety of tones obtainable from red and yellow, through brown to black and blue. The warm browns are especially beautiful. The same emulsion is also coated upon glass for lantern slides. One word to those who experiment with Alpha paper. When first placed in the toning bath the image fades somewhat and becomes of a sickly yellow hue. At this point many of my friends have become disgusted, and have thrown their prints away. If they had had a little more patience they would have seen the image recover itself, strengthen, and finally assume the desired hue. The latitude for over-exposure with this paper is very great, but under-exposure must be avoided.

In the matter of developers for ordinary negatives it is surprising how little the new substances introduced during the last few years—hydroquinone, eikonogen, etc.—have taken hold. I doubt if one British professional out of a hundred ever uses anything but pyro; and the same may be said of amateurs for their regular work, although beginners and experimenters, of course, like to ring all the changes.

As the restrainer, potassium bromide has ousted ammonium bromide.

For the accelerator, people try soda and potash, and then return to ammonia. I would strongly urge the use of a standard developer at a standard temperature (say 65 degrees Fahr.) ; we should then be able to compare results obtained in different countries. For the standard developer I would recommend :

Dry pyro	2 grains
Ammonia (.880)	2 minims
Potassium bromide	1 grain
Boiled distilled water	1 ounce

This is the most backward spring that I can remember. It is nearly May Day, yet not a leaf is out. But this is the best time for photographing country buildings, churches, etc. All their details are visible through the delicate tracery of the tree twigs ; in another month they will be half-concealed from view by the wealth of leafy greenery.

I used Watkins' exposure meter a good deal last season, and with excellent results. It is a brass cylinder $2\frac{1}{2}$ inches long by $1\frac{5}{8}$ inches diameter. The lid at one end takes off, and forms the "bob" of a pendulum which beats half-seconds. In the other end is a roll of bromide paper treated with potassium nitrite. This is exposed to sunlight until it darkens to a given tint. The body of the cylinder

consists of brass rings which are adjusted for light, plate, subject and diaphragm, and the necessary exposure is then at once read off. The whole performance takes only about half-a-minute, and the little instrument is strongly recommended by TALBOT ARCHER.

COLUMBIA COLLEGE PHOTOGRAPHIC EXHIBITION.

THE sixth annual exhibition of the Columbia College Amateur Photographic Society was held in the Chemical Museum, School of Mines, on the afternoons and evenings of May 7th and 8th.

The exhibition must be characterized as an eminently successful one, though there might have been a larger display made by the members themselves.

Taking the apparatus on view, there was a complete stock, interesting historically, as the improvements in cameras from year to year were represented by instruments purchased, or otherwise obtained, at periods in the history of our art ranging from the stereoscopic camera used by Mr. H. T. Anthony previous to 1860, down to the magnificent photomicrographic apparatus made by Carl Zeiss of Jena.

This latter instrument is certainly a marvel of neatness, rigidity and perfectness. The camera is some 6 feet in length and is firmly mounted on a stand, which is separated from the table carrying the microscope and lighting apparatus. These latter are of course the best obtainable and well repaid a careful scrutiny. Close by was a Clark lamp for projection, also a Scott lamp for the same purpose, and, adjoining these, apparatus, standard tuning forks, syrens, etc., used by Dr. Laudy for determining the speed of shutters. A fine collection of photographs and lantern slides, the work of Dr. Laudy, was on exhibition, and were, needless to say, of very great merit.

A unique method of exhibiting lantern slides consisted of mounting a large number in one frame and placing behind them tracing cloth which was illuminated from behind by incandescent electric lamps, bringing out all the details of the picture and giving a very soft effect.

Another feature was the large exhibit of photomechanical work, the Meisenbach, Albertype, Woodburytype, Ives, and a host of other processes being represented by samples of the work done and by specimens showing every stage of procedure.

Coming to photography pure and simple, the exhibit dated back to the beginning, several fine Daguerreotypes, including photos of Webster, Wendell Phillips and others, being on view. Other specimens traced our art up to the present time, leading us through the various printing processes, cyanotype, uranium and so on.

Regarding the contributions to the exhibition by the members themselves we must repeat that there was room for more. Beginning at the end of the room we came first to the work of H. M. Brookfield. The first frame contained several views in the Adirondacks, and some of these certainly showed room for improvement. There were signs of general and partial fogging of the negatives which a little care in manipulation would obviate. "Surf at East Hampton, L. I.," by the same gentleman, was a capital study, and a fine avenue of trees in the same locality is worthy of special praise. A series of pictures taken in the White Mountains were good, especially one, a view down a wooded

ravine, with the cloud-topped mountains in the far distance. The atmospheric effect in this picture was remarkably good. Some photographs of engines, marked as being the product of the Dallmeyer lens, were certainly not good testimonials to the efficiency of that excellent instrument. Mr. Brookfield seems to excel in wooded landscape, but machinery at present is hardly his *forte*.

Two pictures of lightning, by E. G. Brown, were very interesting. In one the lightning is of the horizontal form, never apparently reaching the earth. The other shows two flashes, one very bright and the other less distinct, both having tributary flashes.

Views in Manitou Park, Colo., by Dwight W. Taylor, show evidences of careful work, but the same can hardly be said of some of this gentleman's Yosemite views. Of these latter a few are really excellent, forming an interesting collection, showing the work of geysers in building up terraces and the like.

Studies of ladies and children, by O. Jackson, Jr., were very good, though the side light being too strong, occasionally produced a somewhat harsh effect. The poses were very natural and graceful, showing a freedom from restraint that it would be difficult to obtain if in a studio and the hands of a professional.

As usual, H. R. Taylor's surf pictures at Easton's Beach and Sachnest Point were the best things in the exhibition. The combination of surf and perfectly fitting sky in the view at Sachnest Point makes up a picture to which one may truly point when wishing to illustrate the advance of photography. This picture we understand was made on a Cramer 70 plate. "Newport Harbor" is a capital moonlight effect and "Newport Rocks" is so well known a picture that comment here is needless.

C. H. Young exhibited several views in the Adirondacks, one, Winnebago Bridge at Meacham Lake, being a nicely balanced picture, the water in the foreground reflecting the background of trees, while the old log bridge, boat and boathouse were extremely picturesque.

"Ready for a Start" showed a hunter shouldering his rifle, holding in leash three hounds very much on the alert. Several pictures of slaughtered game were finely brought out, and views along Brandon and Meacham Roads were of particular excellence.

"One, Two, Three," by C. Barton, were two snap-shots showing the various ways of getting into the water off a stone pier. "One, Two" shows a group of some half-dozen, with hands extended, ready for the word. "Three" shows the same group in the air; and a remarkable group it is.

"Why She Liked to Go to Market" forms the subject of two pictures, one showing the young lady just leaving the gate and meeting some one who looks only too ready to carry any parcels; while the second shows the return and the parting. These are two well-conceived studies, and the conception is well carried out technically.

The exhibition was undoubtedly a useful one. The work in a great many instances was above the average, in some equal to the best. The committee are to be congratulated on the result of their efforts, and the members themselves will during the coming summer utilize the information they must gain from seeing each other's work, and produce pictures for the seventh exhibition which will eclipse those shown at the sixth.

A SHIPWRECKED PHOTOGRAPHER.

There is a curious little coincidence connected with the disastrous wreck of the Anchor Line steamship *Utopia* in Gibraltar Bay last March, in which five hundred and sixty-seven lives were lost, which may interest the readers of the Bulletin.

It will be remembered that there were but two saloon passengers, both Americans, on the ill-fated vessel, one of whom, Mr. Davis, of Boston, was lost, but the other, Mr. W. T. Colbron, of New York, was saved. Mr. Colbron is well known in photographic circles as one of our most ardent and industrious amateurs, and enjoys the distinction of having been the first president of that young but flourishing society, the New York Camera Club.

It is from him the story comes, and we give it in his own words:

A Strange Coincidence.

To the Editors of the Bulletin:

I left New York last January for a pleasure trip, of course taking my cameras with me, and after visiting Lisbon, Genoa, Pisa, Florence and Rome, I left Naples for home, March 12th, on board the steamship *Utopia*, which five days later was wrecked in Gibraltar Bay by collision with a British man-of-war, and sank in a few minutes. After struggling in the water for some time I had just given myself up for lost, when I was picked up by a boat from H. M. S. *Anson*, the innocent cause of our disaster. Unable to get back to their own vessel owing to the violence of the gale, my rescuers took me to the flagship *Camperdown*, where I was treated with the utmost kindness, the Admiral himself taking a personal interest in my welfare.

The following day Mr. Horatio J. Sprague, who has been United States Consul in Gibraltar for nearly forty-four years, having heard that an American was among the saved, hastened to me and, with a hearty cordiality I could not withstand, insisted on my going to his house and remaining as his guest until I could continue my homeward journey. He placed his house at my disposal and made me more comfortable than I could have thought it possible for one to be after an experience such as mine.

At dinner I was introduced to the ladies of the family, who were kindness itself, and vied with each other in doing me honor. During the meal, the old housekeeper entered the room, and I saw that she looked at me with some interest, then said a few words to Mr. Sprague, who excused himself and followed her from the room. In a moment he returned with a look of pleased surprise upon his face and said to me: "We are not such strangers as we thought; what would you say if I told you that I have your picture?" and he held up to my astonished gaze a small photogravure, a most excellent likeness of myself.

Seeing my surprise, my kind host hastened to explain the strange coincidence of having my picture, a stranger to him, in his possession. It seems that he has been receiving regularly a copy of the Bulletin, in one issue of which, that of August 23, 1890, Messrs. Anthony & Co. did me the honor to place a portrait of myself as frontispiece illustration, and the picture happened to attract Mr. Sprague's notice from its resemblance to a friend, and so interested him that he cut it out and stuck it in the frame of his looking-glass. When the housekeeper, drawn by natural curiosity to see a survivor of the great disaster, entered

the dining room, she recognized me at once as the original of the portrait and called her master's attention to the fact.

The little incident made me feel at home at once in the pleasant household where I had been so kindly welcomed, and brought forcibly to my mind the old saying that the world was small after all—for it certainly seemed a little queer that the original of the one picture, of all those published in the BULLETIN, which interested Mr. Sprague, should have been thus strangely thrown upon his generous hospitality.

I do not exactly know whether I shall look upon this coincidence as an evidence of my international fame (?) or of the wide-spread popularity of the BULLETIN, but I hope that you will allow me some little share of honor. At all events, I thought this letter might prove of interest to you.

Sincerely yours,

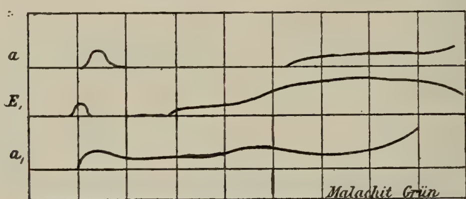
W. TOWNSEND COLBRON.

THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES.

BY J. J. ACWORTH, PH.D., F. I. C., ETC.

(*Continued.*)

Malachite Green.—This dye is easily soluble in water. In gelatine it shows a maximum of absorption at about the same place as with aldehyde green. The band begins at *C*, quickly rises to a maximum, thence decreasing until *D*. The absorption in the blue and beyond is similar. For sensitizing, the dye can be added both before or after emulsification with equal effect, the proportion I

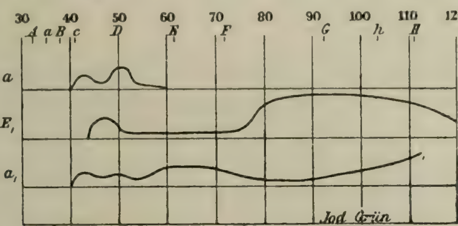


For explanation of drawings see foot note page 267.

found the best being about .03 gram of dye to every 2 grams of AgBr present. In one case I used ammonia to assist sensitiveness, (this in larger quantities bleaches out the color), in other cases ammonia and $AgNO_3$ for the same purpose with equal results. These emulsions gave a sensitiveness curve closely agreeing with that of Eder, namely, a maximum at *C*, thence a gap till *E* when sensitiveness increases gradually and attains a maximum at *G*. The absorption of this emulsion starts from $B\frac{1}{2}C$, increases to a maximum at $C\frac{1}{3}D$, gradually decreases toward *D*, slightly rises at *F*, but decreasing to a second small minimum at *G*, thence rising again as usual.

Iodine Green.—This dye dissolves easily in water and gives no precipitate with $AgNO_3$. In gelatine it shows two absorption bands, one beginning at $B\frac{1}{2}C$, attaining a maximum at *C;* the second maximum is at *D*, with a minimum between. This dye in gelatine shows a curious phenomenon which is, that on the same plate coated with dyed gelatine, it may so happen that either band may show the greater absorption. Before I discovered this fact, I imagined there must have been a mistake somewhere, for, on comparing my negative with the

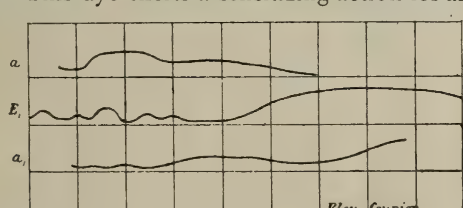
visually examined absorption, I could only find one band in the latter at all distinct, whereas the negative showed two. On trying some other part of the plate I discovered the missing band, and found it even to excel the other in absorptive power. The only suggestion I can make for this is, that if a dye possess two or more absorptive bands, one or more may become weakened or destroyed by the action of heat or light or both combined, the remaining band or bands resisting these influences more strongly. This action, no doubt, simply means "fading" of the dye. Iodine green gave me much trouble to get anything like good



results, the dye seems a most sensitive body to deal with, it slows the emulsion very considerably, and sometimes I got absorption bands and sometimes not. One fairly satisfactory result I got by adding about .03 gram of the dye to every 2 grams of AgBr present before emulsification. In other experiments I added as much as 15 per cent. of dye to AgBr present without good results. Some of the most successful were obtained by adding the dye just before coating the plates, with a small addition of $AgNO_3$ and with or without ammonia. The maximum of sensitizing action seems pretty much the same in all cases; the exposures, however, varying considerably, from an hour or two up to several days. Although in gelatine the dye shows two absorption maxima, the dyed emulsion shows only one in all cases I have tried. This begins at $C\frac{1}{3}D$ and reaches a maximum at $C\frac{1}{2}D$, decreasing until D, then keeping uniform as far as $F\frac{1}{3}G$, when it again increases and attains a second maximum at $F\frac{2}{3}G$.

As regards absorptions these were on the whole unsatisfactory. Variations occurred in the intensity of the two bands the same as in the case of the plain dyed gelatine film. However, as a rule, the absorption of iodine green sensitized plates may be taken as I have drawn it, the absorption bands varying in intensity according to the amounts of dye present, the positions being practically similar to those of the plain dyed gelatine film. There is, however, in the former a considerable general absorption from E to F, diminishing to a minimum at $F\frac{2}{3}G$ before rising to the greatest maximum at h.

Coupier's Blue.—This dye exerts a sensitizing action for all the less refrangible



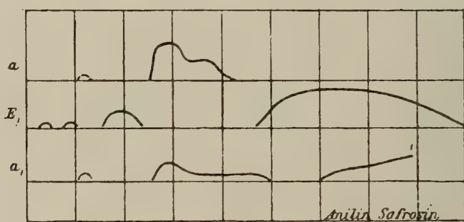
rays from E to the infra red. It is best dissolved in water. A gelatine film stained with this dye showed that absorption commences at a, at C it begins to increase and passes through D as a maximum, decreases at $D\frac{1}{2}E$ and gradually fades away at G. For sensitizing gelatino bromide of silver I found .01 gram

of the dye to every 2 grams of the AgBr present about the best quantity to employ; if used in larger quantities it slows the emulsion considerably and stains it also darkly.

Professor Eder states that this dye gives only two bands. I found on close examination that besides the usual maximum in blue, it gives five bands in the less refrangible part of the spectrum. The first begins on the less refrangible side of A, attains a maximum between A and a; the second maximum occurs at C, the third at $C\frac{1}{2}D$, the fourth at $D\frac{1}{2}E$, and the fifth just before E, each maximum being divided by a minimum. The third or middle of these maxima is the most intense.

As regards absorption of the gelatino-bromide dyed film, the maxima in the negative are too indistinct to be drawn with certainty. The absorption curve given may be taken as fairly representing what I obtained.

Anilin Safrosin.—I am indebted to the kindness of Professor O. F. Fischer for a pure sample of this dye. I found it easily soluble in water and extremely tinctorial. $AgNO_3$ produces a heavy precipitate soluble in water free from $AgNO_3$. In gelatine the absorption spectrum will be found to agree very nearly with that of eosin. It commences at $D\frac{1}{2}E$, reaching a maximum at about E, again rising to a second small maximum, then fading away toward F. Anilin safrosin

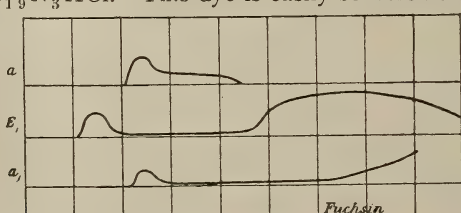


is characterized by an extreme slowing action upon AgBr emulsions, similar in this respect to safranin. For getting the best sensitizing effect I used from $\frac{1}{2}$ to 2 per cent. of dye to the AgBr present, the former quantity being the better.

The sensitiveness maxima are three in number : the first between A and a, the second between B and C; the third and principal starts from $C\frac{1}{2}D$, and reaches a maximum just before D, and vanishes away at $D\frac{1}{3}E$. Soon beyond F commences blue violet sensitiveness.

This dye also exhibits the curious phenomenon of bleaching in the red and ultra red during development very similar to that of safranin. The absorption spectrum appears to consist of a band at C–$C\frac{1}{4}D$ (of which I am not quite certain). A second absorption begins at $D\frac{2}{5}E$, reaching a maximum at $D\frac{3}{4}E$, decreasing and ending at $F\frac{1}{2}G$. At G the principal absorption corresponding to the absorption of AgBr begins, and soon reaches a maximum.

Fuchsin.—$C_{20}H_{19}N_3HCl$. This dye is easily soluble in water or water and



alcohol. $AgNO_3$ gives no precipitate. The absorption of a fuchsin-dyed gelatine film resembles very much that of anilin red. The maximum lies at $D\frac{1}{3}E$,

Negative by Harry Platt, Nantucket.

THE OLD WINDMILL, NANTUCKET, MASS.

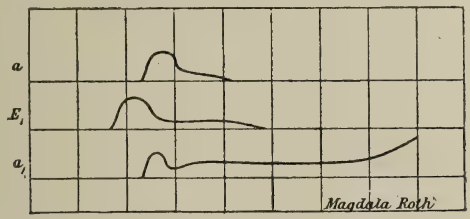
BUILT 1746.

but shades off more gradually on the more refrangible side than in the case of anilin red.

For sensitizing I use .05–.10 gram of the dye to every 2 grams of AgBr present, and besides .05 $AgNO_3$, but no ammonia. This emulsion gave a somewhat broad but intense band at $C\frac{1}{3}D$, running down to nearly nothing before D, and remaining as such until the commencement of blue violet sensitiveness of AgBr.

The absorption maximum is considerably displaced; it runs steeply to a maximum at $D\frac{1}{3}E$; at $D\frac{2}{3}E$ it decreases to almost nothing, and remains so until past G, when it rises on account of AgBr absorption.

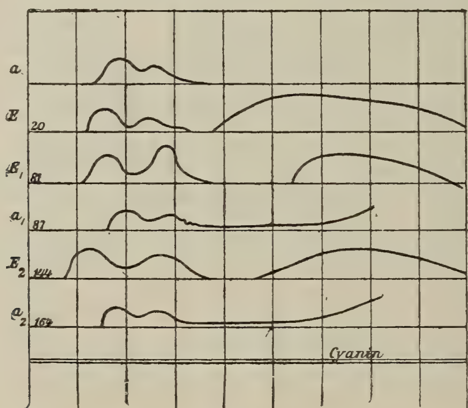
Rose Magdala.—(Naphthol red, chlorhydrate of rose naphthylamine $C_{30}H_{21}N_3$ HCl). Is insoluble in water, but soluble in water and alcohol. A film of gelatine stained with this dye shows a strong maximum of absorption at $D\frac{2}{3}E$, diminishing very considerably at E, and down to almost nothing at F. Added to silver bromide emulsion, rose magdala sensitizes powerfully for yellow, at the same time without so materially reducing sensitiveness, as in the case when using most of the anilin dyes. To every 2 grams of AgBr present in the emulsion about .05 gram is a suitable quantity of dye to add for obtaining good sensi-



tizing and absorption effect; also a small quantity of ammonia is useful for increasing sensitiveness. The sensitizing action begins at $C\frac{2}{3}D$, rises to a broad maximum on both sides of D, becoming considerably reduced at $D\frac{1}{2}E$, and nothing at F, and showing little blue or violet sensitiveness, even with considerably longer exposure. The absorption of this emulsion commences at $D\frac{1}{3}E$, rises steeply to a maximum at $D\frac{2}{3}E$, decreasing to a minimum at a little before E, rising again on the other side of E, and further beyond showing slight AgBr absorption.

Cyanin, $C_{29}H_{35}N_2I$.—This dye dissolves easily in a mixture of alcohol and water. In gelatine the absorption begins at $C\frac{1}{3}D$, rapidly becoming a maximum which continues till over D, then to a minimum at $D\frac{1}{4}E$, again rising to a second maximum less intense than the first at $D\frac{1}{2}E$, and gradually decreasing to nothing at about $E\frac{1}{2}F$. With regard to sensitizing action, I got results not quite identical. The first (No. 20) I obtained by adding cyanin to a finished bromo-iodide emulsion with ammonia in proportion of .001 gram of cyanin to every gram of the mixed silver salts. Here the displacement of the sensitizing action in relation to the absorptive action of the dye itself is not great. Sensitiveness commences at C, reaches a maximum at $C\frac{1}{2}D$ and a minimum at D, then rising to a second and greater maximum at $D\frac{1}{3}E$, and gradually decreasing to nothing at a little beyond E, after which begins strong blue violet sensitiveness. This curve is the nearest I got on comparing my results with those of Dr. Eder. I did not photograph the absorption of this emulsion for the reason that its coarse grain rendered it too opaque to light. Amongst many other experiments, mostly

failures on account of fog supervening, I got results with gelatino bromo-chloride of silver. Here we observe quite unlooked-for results (see curve No. 81); the light sensitive bands become considerably separated, the lesser refrangible band remains practically in the same place, thence a wide minimum extending till $D\frac{1}{3}E$, whence it rises steeply and becomes a maximum at $D\frac{2}{3}E$, again rapidly decreasing and becoming nothing at a little beyond E. The more refrangible maximum, which in the case of the bromo-iodide was the lesser, has now become the chief one, and shows, when compared with its own absorption band, but slight displacement toward the red, and when compared with the dyed gela-



tine absorption it shows slight displacement toward the blue—the only case I have at present come across.

The absorption of this sensitized emulsion begins at $C\frac{1}{2}D$, rises quickly to a maximum at $C\frac{3}{4}D$ and continues the same through D, decreasing to a not very deep minimum at $D\frac{1}{4}E$, rising again to a second maximum at $D\frac{2}{3}E$, after which it again decreases.

Most of my experiments were made with silver bromide. The one referred to in the drawing (No. 144), was made with .04 gram cyanin to every 2 grams AgBr present, besides .045 gram $AgNO_3$ and .25c. c. ammonia .937. This again gives a result quite different from the others, the sensitizing district is wider (possibly due to using a larger quantity of the dye), especially in the red. The less refrangible band begins at B, attains a broad maximum at a little beyond C, diminishing to a broad minimum at $C\frac{2}{3}D$, again increasing to a second broad maximum at about $D\frac{1}{2}E$, decreasing rapidly toward E.

The absorption of this emulsion, though there is considerable difference as regards light sensitiveness, is very similar to that of bromo-iodide emulsion. In the case of the less refrangible band, the absorption, as compared with sensitizing action, is displaced considerably toward the more refrangible part of the spectrum, but in the case of the more refrangible band the displacement, if any, is quite trifling.

It requires great care when sensitizing with large quantities of cyanin to prevent fog occurring. Several interesting facts above cited as regards shifting of sensitiveness maxima and the reversal of the relative intensity of these maxima require further work to elucidate their cause.

I may state, finally, that No. 20 was an ordinary bromo-iodide emulsion to which cyanin and ammonia were added before coating. No. 81 was a bromo-

chloride emulsion to which cyanin was added alone. No. 144 was a bromide emulsion to which cyanin, together with $AgNO_3$ and ammonia, were added.

I now come to the results obtained with dyes of the so-called eosin series.

(*To be continued.*)

PRESIDENT'S ADDRESS—CAMERA CLUB CONFERENCE (LONDON).

BY CAPTAIN W. DE W. ABNEY.

OWING to the honor done me by the Camera Club, I am again called upon to preside over the annual conference; and on this occasion, as on the last, I feel that it would have been better had some one else been called upon to take the chair. That the Camera Club exercise a power of doing good can scarcely be denied, both by its weekly meetings and its annual conferences, and I may express a hope that in this one its prestige will not suffer. A President's address, as a rule, is supposed to be outside debate; but I do not wish on this occasion to shield myself from criticism, because what I shall say on one subject will bear discussion, and I shall be glad to hear the strictures or adverse opinions regarding it, as in a matter of this description no Popedom is permissible. I allude to an international standard decimal system of weights and measures for photographic purposes. The first point to be considered is as to whether it is desirable that such a standard should exist; and, secondly, what such standards should be. As I am delegated by the Photographic Society to take part on its behalf at the International Congress, that is to take place at Brussels, in August next, I am bound to make my observations somewhat under reserve, since if not, it might be supposed that I should go to such congress with a mind warped, to a not wise extent, by expressed opinion. Let me say once for all that any opinion I do express is only that held for the moment, and may be modified by the arguments which may be put forward by the many eminent colleagues whom one is sure to meet at that congress. As to the first point, whether it is desirable that uniform standards should be internationally adopted, if it be looked at from a commercial aspect, there can only be one opinion, that it is most advisable. Those English firms who manufacture plates, for instance, must have found not only that foreign markets are in a measure closed against their manufactures owing to the trouble and expense that is caused by coating plates of sizes quite different to those current in the English market; and it would be a boon to them to be able to send sizes abroad identical with those which they manufacture for home consumption. Now, as to what the standards should be raises questions which have been considered by a committee of the Photographic Society, and they have made suggestions which seem to go some way toward the solution of the problem. I believe I am right in saying, for instance, that they have recommended as a starting point for plates, the half-plate of 6½ x 4½, and have made most of the other sizes multiples or submultiples of these. The nearest size in centimeters is 26 x 18, and is one which is largely employed abroad, many sizes being multiples of this. If the centimeter were .4, the plates would be exactly equal; but as it is .394, there is a slight difference between the two, but not sufficient to render English half-plates unusable by foreign photographers. It should be noticed, however, that our present whole plate becomes a size which is not to be found. It becomes 9 x 6½ inches, instead of 8½ x 6½. The former, to my mind, is a plate of more artistic dimensions, the present whole plate being somewhat squat. The next multiple is 13 x 9 inches. I have long ago adopted 12 x 9 as much better than 12 x 10, which is an atrocious proportion. I am inclined to think that 12 x 9 is better than 13 x 9, the length being rather too great when the long side is used for an upright view. Balancing the advantage to be gained by uniformity, however, it seems to me that the proposed sizes are better than our present ones, which seem to have been chosen in a purely haphazard manner. By a compromise of this kind, the

worshipers and users of the centimeter system are rendered happy, and the English have the great advantage of retaining as at present the British inch, a standard which, to me, is far preferable to the centimeter, as it is a unit involving too large numbers for small sizes.

So much, then, for a happy compromise between English and foreign measures.

Now, as to the weights and volumes employed, is it possible that any compromise can be arrived at? If we were in a new nation without a history and without prejudices, and acting simply out of necessity, I am inclined to think that we might perhaps be induced to adopt the gram and cubic centimeter as the standard of our weights and volume measures, and to use the decimal system. We might also possibly adopt the franc as our standard of money value, for an income of 2,500 francs sounds much larger than one of £100; but we are not a new, and certainly not an unprejudiced, nation, and although the decimal system has been permissive for some years, and though it has been taught in our elementary schools, yet I have not gathered that any one has adopted it in home commerce, that the farmer sells his wheat by the cubic meter, or the tradesman weighs his beef by the kilo, or sweets by the gram. In fact, it appears that no impression has been made on our own systems. Under these circumstances, it would appear that the hope that foreign weights and measures would be adopted by the professional photographer is not the most likely thing in the world to be realized; for although our chemists do almost exclusively use the metric system, yet photographers are not chemists as a rule, and I suspect that a book or a formula which talked exclusively of grams and cubic centimeters would not meet with ready acceptance by them. My own opinion is that the gram is a less convenient standard for photographers than the grain. The photographer never requires to be more accurate than to a grain, but he must be more accurate than to a gram. It appears to me that the requirements of internationality would be met by giving all photographic formulas in parts. Thus a 1 per cent. solution of pyrogallic acid in water would mean 1 grain of pyrogallic acid dissolved in 100 grains of water, or equally 1 gram dissolved in 100 cubic centimeters, and a 1 per cent. solution of pyrogallic acid in alcohol would mean 1 grain of pyrogallic acid dissolved in the same volume of alcohol that the 100 grains of water would occupy. Luckily such measures are not unknown to us. The gallon of water weighs 70,000 grains, and the old septem and decem burette measure was divided into volumes of which the water between two divisions weighed 7 grains and 10 grains respectively. By adopting the grain as the unit of weight and the decem as the unit of volume we arrive at a practical compromise. The photographer would only have to abandon his ounce measure and take to a decem measure; the 5-ounce measure would be of about the same size as that holding 200 decems, *i. e.*, 2,000 grains.

Since we last met in conference we have had one valuable piece of work put forward as regards the science of photography. I allude to the researches of Messrs. Hurter and Driffield on the relation of density to exposure to light or to intensity of light. I have to speak in the highest terms of the labor and research expended upon it, although I have had the misfortune to differ as to which is the best way of measuring density, or rather, I should say, as to the accuracy of the method which they adopted and as to the incorrectness of my method. I am happy to say that a meeting between the quondam antagonists has had a happy effect, and, no doubt, an agreement which will be endorsed by both sides will shortly be arrived at, which will end the dispute and prove satisfactory to the lovers of truth, and at the same time be a disappointment to those whose idea is that the best way to advance science is to quarrel over it. When such an agreement is arrived at, the field will be left clear to verify all the remarkable outcome of the work they have actually undertaken. I think I may claim to have been the first in the field as regards the publication of a theory connecting density of negative and exposure together; and I have given a formula which seemed to me to meet the general question. Should the formula of Messrs. Hurter

and Driffield prove to be more correct, and to meet the theoretical considerations more adequately, I shall only too gladly discard the first formula and become a stanch adherent to the more exact one. The matter was so important in my eyes before any controversy was held, that, as editor of the *Photographic Journal*, I had it published in full in that publication, for which I have had adverse comments passed upon me. I think, considering the scientific importance of quantitative photography, I was fully justified in publishing anything in full which might prove an advance, and I should do so again. I may finally add, that Messrs. Hurter and Driffield are fully convinced of the accuracy of my instrument as I am of theirs, when naked lights are in question; and I take this opportunity of saying this publicly, as I believe they have done the same before the Society of Chemical Industry, before which body their paper and its strictures on my Sector Photometer originally were brought forward.

Once more we have had an announcement that photography in natural colors was an achieved fact, and, as I pointed out last year, the achieved fact is almost as old as photography; but in this case we have had an assurance that the colors are fixed, in which case it would be a distinct step towards achieving what has so far proved chimerical. While in Paris last week I had an invitation to see M. Lippmann and to investigate his methods, and I found in him a true man of science, as his reputation always has been, and ready to give every detail of his work. I have seen his colored spectra, and there is no doubt that the colors are due to interference, and are not what I may call true colors, since they vary according to the angle in which the plate is held, and they show next to none, if any at all, by transmitted light.

The process, as described to me, is very simple. Mercury is poured into a box of four sides, the top and front being open. Against the front the film side of the sensitive plate is pressed mechanically, and mercury is poured in from behind. The exposure is made to a bright spectrum, the blue being exposed less than the red. If the relative exposures be correct, and if the development be carried just far enough, on fixing, the colors are seen by reflected light, and are unchangeable as far as light is concerned. The development takes place by means of alkaline carbonate development, and intensification by silver. The most successful results are obtained when the plate is prepared as a dry albumen plate on collodion. M. Lippmann stated that if the plate be immersed in benzine or other such liquid, the interference colors change, and the red part of the spectrum might be seen as blue; but that on drying it reverted to the original color. Further, he stated that if the exposure were not exactly correct, and also the development pushed exactly far enough, the colors were not apparent.

I am myself satisfied that every statement made by M. Lippmann is correct, and I doubt if he claims to have discovered photography in natural colors. To me it seems a verification of Newton's law of the interference of light and hardly in the direction of true photography in natural colors. Photography in natural colors means to me the production of pigments, of which the color is produced by absorption, and which can be rendered permanent when exposed to white light. Becquerel's experiments satisfied the first part, but the second was wanting, and this renders the problem still unsolved. M. Lippmann has succeeded in fixing interference colors, but they are not due to the absorption of certain rays of white light. Further, they must, I should think, be impure colors, and at their best be as impure though as brilliant as the colors produced by polarized light. The fact that the colors depend on proper relative exposure, and on proper amount of development or intensification, makes the process one of extreme difficulty; and as, if this were overcome, a picture would always have to be examined by light coming at one angle, this leaves the problem of photography in permanent natural colors very much as it was before M. Lippmann took it up. We have evidence that the excessive fervor of journalists in bringing to public notice a new thing has been detrimental to the discoverer, as in Dr. Koch's case, more being claimed for the remedy by them than by him; and I think that the startling announcements put in the daily press have in this

case made the position of M. Lippmann more difficult than it otherwise would have been. I feel that I have already detained the conference too long, but the points I have brought forward had to be mentioned, and I trust that whatever opinions I have expressed may be simply taken as opinions, but that the facts I have given may be considered worthy of the bestowal of some thought by those who are interested in the subject.

ELECTRO-PHOTOTYPY.—A NEW METHOD OF PHOTO-MECHANICAL PRINTING.

BY MR. HENRY SUTTON.

[Read before the Camera Club Conference, London.]

IT is not an easy task to place before you the result of many years' experiments, particularly when that result may be stated in a few minutes. It is the reward of most experimentalists that the labor of years may be summed up by a few figures, or some score of words expressing a few concrete facts. Till last Monday I did not consider my experiments sufficiently advanced to bring before the members of the Camera Club, and though not quite complete at present, they are sufficiently so to report progress.

I will not go into the history of the inception and development of this photo-mechanical process further than to say that it dates from 1881. I think most scientific men who understand the production of half-tone process blocks feel convinced that the present methods of obtaining the result are too roundabout, and that could some direct method of producing a block from a photograph without the conversion into a fatty-ink or bitumen image, and subsequent skilled etching, be discovered, a great impetus would be given to the graphic arts.

Without pretending to a final solution, I think the present process may claim to be on the right track, and that it only needs the experience gained in every-day work to render it a letterpress block process of high quality.

The process is simply a means of direct electrotypy on a relief, produced on a gelatino-bromide negative, the electro being then passed on to the printer. Producing a relief on a gelatino-bromide negative dispenses with the use of collodion, with zinc or other surface sensitized with bichromated albumen and gelatine or bitumen, and with the difficult art of etching.

I must be understood as distinctly referring to half-tone block work.

A gelatino-bromide negative is developed with alkaline pyro or hydroquinone, then fixed in strong hypo; when washed, care being taken the image does not absorb too much water, the plate is placed on a metal support and gradually heated to 212 degrees Fahr. This is very simple, and if tried will result in an extraordinary production, the most probable being the shadows of the image running all over the plate.

If we take a negative that has been impressed with a screen of some definite pattern, we get a very different result.

Each little dot on the screen image holds an amount of reduced silver, bearing some definite proportion to the action of light and development; this is surrounded by a fine line, containing no silver, due to the opacity of the screen preventing any action.

If we examine the little squares, we find the reduced silver has produced a certain amount of insolubility, the absorption or combination of the freed bromine with the gelatine a further amount, and a similar action due to the pyro.

Now, on raising the temperature of such a film to the melting point of the part holding no silver, these portions melt, and are drawn by capillary action under the unmelted dots. This capillary action is evidently proportional in some way to the amount of reduced silver, and, therefore, to the image.

The importance of this consists in that the image becomes the actual regulator

of the sizes of the dots; such being the case, we have the remarkable fact that the image is engraving itself, and the two operations of relief and graduation are proceeding at the same time.

To understand the nature of this, it is necessary to remark that, in ordinary half-tone work, the endeavor is made to produce a graduated screen negative by optical means—well known to all who have studied the matter—and then reproduce from this graduated screen negative by etching in zinc or copper.

The blocks shown are all electros taken direct off camera negatives, the oval block being direct from a silver print, the others from glass positives.

The large electro is deposited by dynamo, and may be readily printed by any printer; the other blocks are deposited by battery, and require fine printing. It remains now to produce something between, a not very difficult matter at the present stage.

Discussion.

Mr. Bolas—I am under the impression that the use of a gelatine-bromide plate as a mold came from Mr. Swan some years ago, and Mr. Warnerke has worked in the same direction. I don't understand how Mr. Sutton gets rid of the gelatine.

Mr. Sutton—The gelatine is not removed from the plate. The soluble gelatine is drawn by capillary action under the portions rendered insoluble by the action of light, pyro, and hypo. The advantage of that is that the amount of absorption seems to vary with the action of the light, so that the image graduates itself.

Mr. Debenham—This seems to me the newest departure for some time, and of great ingenuity, from which I hope we shall see many fine results. I think it is a credit to the Camera Club to have had it brought forward before it.

Mr. Warnerke—It is difficult for me to make any observations, as I did not hear everything that was said. I observed that Mr. Bolas compared it to my own process, described some time ago. In my process I transfer it, and in that respect the present process is different from mine. I remove the soluble part of the gelatine; here it is not removed.

Mr. Sutton—When you look into this you will find that it is the reverse of the ordinary process. My screen is a positive; in the ordinary process it is a negative.

Mr. Warnerke—What process of electrotyping do you use?

Mr. Sutton—I blacklead the gelatine, as I find that a better process.

Mr. Warnerke—In some experiments I made in electrotyping the film, I found that it swelled more than was desirable in the copper bath, and then the outlines suffered. A Russian physicist uses a very good process. He dusts the film with finely-pulverized iron dust, and puts it gently into a copper bath, when a coating of copper is quickly deposited, the gelatine not having time to swell.

Mr. Lyonel Clark—Would the film be able to stand a papier maché mold where quickness was desired, so that the block might be produced in type metal?

Mr. Sutton—Yes, if the film were on celluloid, but probably not on glass. The proofs I hand round are taken from the middle of 500 printed for me by Messrs. Whittingham. The blocks are made ready like an ordinary printer's block; the machines are not yet sufficiently perfect to do without that.

A Speaker—Is the block made by depositing the copper on the film itself?

The President—Yes. Mr. Sutton also told me that you could keep the block in water for some time and it would not swell.

Mr. Maskell—Comparing this with other gelatine processes, what loss is there? In the older methods there is what is called rotting of the gelatine.

Mr. Sutton—Absolutely none. The gelatine can be put in water for a week and would only show a slight swelling.

Sir H. Trueman Wood—The process seems a rather interesting development of suggestions made from time to time for obtaining reliefs from gelatine negatives by the application of hot water. Has Mr. Sutton tried printing from the surface of the gelatine itself instead of electrotyping it? I think there is an opening, when great rapidity is necessary, for work of this kind. I should also like to know what evidence he has that the gelatine is absorbed under the insoluble parts of the plate.

Mr. Sutton—You will find that this process is the exact reverse of the hot water process. By this you do not wash the insoluble gelatine away. Here the plate is put over a Bunsen burner and the temperature gradually raised, and if you watch you will see the soluble parts melt, and the others gradually rising.

Mr. Lyonel Clark—I can quite corroborate that effect by my own experience, when I dried a plate too quickly; but I was not clever enough to make a process of it.

The PRESIDENT—I think the Conference must congratulate itself on having this process brought before it, which, I understand, was perfected after Mr. Sutton became a member of the Camera Club; therefore we are doubly glad that it should be brought forward at this Conference. I am pretty well familiar with all these processes, and it seems to me to be a novelty. I know Mr. Warnerke's process, but the great difference between the two seems to be the reversal of the order of things, and also in the fact that you have this capillarity brought into play. If Mr. Clark had not confirmed that I should have done so, particularly with respect to one plate of a line subject. I will now ask you to pass a vote of thanks to Mr. Sutton for his paper.

IRVING'S "SUNNYSIDE."

INTERESTING HISTORY OF THE COTTAGE NEAR TARRYTOWN.

PASSENGERS on the Hudson River Railroad are often struck by the appearance of a quaint little white building in Dutch style of architecture on the east side of the tracks, and having the date 1656 in large numerals near the peak of the roof. It is situated about midway between Irvington and Tarrytown, and is known to the literary world as "Sunnyside," the cozy home of Washington Irving, and with it some of the best of his romances of the Hudson are connected. Among them may be mentioned "Wolfert's Roost" and "The Legend of Sleepy Hollow."

This cottage was originally a stone building with many gables and was modeled after Governor Stuyvesant's cocked hat. It was built by Wolfert Acker, a self-exiled Privy Councilman of Stuyvesant's Court, as an asylum from trouble, But he did not find rest, as his wife opposed him there as much as did the citizens of the busy Court.

Finally the "Roost," as it came to be called, passed into the hands of Jacob Van Tassel, a Dutchman and a Whig, whose long goose gun became the terror of cowboys and skinners and marauding craft on the river and secured the dwelling from violence. He was captured by the British and taken to New York. His wife remained at the "Roost," and when attacked, subsequently, by armed men from a British ship she, with the women servants, seized mops, pokers, shovels, broomsticks, and all sorts of household articles in defense, but they were captured. The house was sacked and burned. They attempted to carry off Mrs. Van Tassel, but mother, aunt, and Dinah flew to the rescue. The struggle continued to the water's edge, when a trumpet blast from the ship riding at anchor caused the men to desist.

After the war the Roost was rebuilt in more modern style, and so Irving found it, with its ancient walls, and upon these he fashioned the delightful cottage of "Sunnyside." At the foot of its grassy bank, betweed the house and the railroad tracks, yet bubbles up the delicious spring of water which tradition says Femmitie Van Blarcom took up near Rotterdam and brought over in her churn.

The room and table with writing materials upon it, just as Irving left them, are preserved in this little house, which is often visited by the curious.—*New York Times.*

OUR TWO ILLUSTRATIONS.

THE beautiful Heliotype frontispiece of this issue of the BULLETIN is from a handsome negative made by Mr. S. P. Wells of the Cramer Dry Plate Co. It is a view from the Cliff House, California, looking south on San Francisco Bay, and shows what can be done with a "C" Cramer plate, a Dallmeyer single achromatic lens and the Prosch shutter at the strongest spring. It is not often that we can secure such fine examples of instantaneous photography. Mr. Wells obtained this view during his trip to the Pacific Coast and we were fortunate to acquire the use of the negative of such a fine effect.

The second illustration is from a view made by Mr. Harry Platt, of Nantucket, Mass. It is one of those artistic bits that are found in many of the New England States and forms a very pretty picture. From a photographic point of view it is a good piece of work and reveals the effect of a high-class negative. The print is from a half-tone plate by the Kurtz process.

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Photographic Bulletin.
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AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE regular monthly meeting was held on Tuesday, May 5th, Mr. Henry J. Newton calling for order at 8.15.

The Secretary acknowledged the receipt of copies of the "Photographic Eye." He also stated that Mr. Hull would not exhibit his slides that evening, preferring to wait until the fall, and that Mr. A. D. Fisk had kindly consented to officiate and would show a series of slides, the work of New York amateurs. At the June meeting it was hoped to have a fine series of slides, the product of the best workers, the idea being to compare modern work with that of older workers and older processes.

Mr. A. D. Fisk exhibited a spirit level swinging on a hinge, particularly for attachment to the swing back of the camera. He also showed a magazine hand camera, made by Abrahams, of England. This carries twelve quarter plates and the shutter, which is always set, and magazine arrangement, were very ingenious.

It was proposed and seconded that the chairman name a committee of four to make arrangements for the annual excursion and dinner. The following gentlemen constitute this committee: Dr. A. H. Elliott, Mr. O. G. Mason, Mr. C. Van Brunt and Mr. Lincoln Adams.

Mr. Fisk then exhibited the lantern slides and some truly capital work was shown, eliciting much applause from the audience. The slides were a mixed lot embracing all parts of the world, from "Ploughing in Egypt," to the "Deck of the City of Berlin," to the Adirondacks and all parts of New York State. Many were of the finest quality and should appear again at the June competitive meeting.

The meeting adjourned at 9.45.

ROCHESTER CAMERA CLUB.

THE regular meeting of the Rochester Camera Club was held at the parlors of the club, May 1st. *President* CROUGHTON in the chair. Minutes of the last meeting were read and approved. Minutes of meeting of Board of Directors read and approved. Among the important actions of the club were the selection of Scottsville as the place of the annual Memorial Day outing, the limitation to membership of the club to seventy-five, and the levying of an assessment of fifty cents on each of the fifty-eight members to pay for the fitting up of the new skylight in the operating room.

Professor C. V. Forbes, of the University of Rochester, is to give an illustrated lecture at the next meeting of the club, entitled "The Philosophy of the Latent Image and Its Development."

The report of the Treasurer showed the club to be in a prosperous condition.

G. W. HASKINS,
Assistant Secretary.

BROOKLYN INSTITUTE—PHOTOGRAPHIC DEPARTMENT.

A LARGE company of artists and photographic amateurs gathered on the evening of May 12th at the gallery of the Brooklyn Art Association to view the first exhibition of photographic prints by members of the Department of Photography in the Brooklyn Institute. As the first important exhibition of photographs ever held in this city, the display had a certain novelty not only for connoisseurs of the camera—of which the number increases marvelously—but for artists and others inter-

ested in watching the rapid advances of the half-century-old science of the lens and sensitive plate.

Nearly five hundred photographs and more than seventy-five lantern slides were upon the walls. Many were hung singly, but the most were framed in "sets" of from six to twenty. The great hall gave abundant room for each of the twenty odd exhibitors, and every one got a place on the "line."

The "jury"—Joseph H. Boston, the painter; H. M. Steele, of the art department of *Scribner's Magazine*, and Frank Pearsall for the professionals—assembled in the gallery late in the afternoon. They gave the following verdict of "honorable mention" in eleven departments, the twelfth, architecture, having no competitors:

(1) For the strongest union of technical excellence, with artistic purpose, No. 64, "Brother and Sister."—Alexander Black.

(2) For the greatest artistic excellence, No. 64, "Brother and Sister."—Alexander Black.

(3) For the greatest technical excellence, No. 71 J, "Portrait of President Black."—John H. Dingman.

(4) For the best landscape, No. 83 A (no title).—William H. Woodcock.

(5) For the best portraiture, No. 64, "Brother and Sister."—Alexander Black.

(6) For the best interior, No. 66, "Studio Interior."—Alexander Black.

(7) For the best scientific photograph, No. 10 E, "Eye of Robber Fly" (750 diameters). —Lewis P. Atkinson.

(8) For the best photograph made by a hand camera, No. 71 M, "Lawn Tennis Group at Prospect Park."—John H, Dingman.

(9) For the best grouping and composition, No. 65 F, "The Death of the Tree."—Alexander Black.

(10) For the best group of slides.—Frank A. Butler.

(11) For the best single slide, No. 30 (X) "Old Fishing Boat."—George W. Street.

The prints not only represented a great variety of subjects and methods of taking photographs, but revealed many forms of printing them. The ordinary "silver prints," such as those with which the average photographic album is filled, were supplemented by "bromide," "aristotype," and other varieties of printing. There were a number of interesting enlargements, such as those made by Mr. William T. Wintringham from the small hand camera negatives, of yachting and other marine views. These are of excellent quality. Other excellent enlargements on bromide paper are by Mr. Lewis P. Atkinson, a skillful amateur, who also exhibited an interesting frame of photo-micrographic subjects, among them an enlargement of 750 diameters from the eye of a robber fly. Some fine landscapes were by J. Foster Flagg. An exhibitor whose technical skill attracted notice was Henry J. Newton.

Dr. L. E. Meeker, who is ever prone to discuss the joyless life of a married man, exhibited such views as "Solid Comfort," "A Quiet Evening at Home," "Reading St. Nicholas," "Home Work," and "A Waif." There were twenty-two of his views altogether, and all of them showed merit. Professor William C. Peckham displayed several charming views of Kennebunkport, Me. Alexander Black exhibited some rare gems in the portrait line, most of the subjects being children. Not the least among his views were some very pretty hand camera shots. Mrs. Benjamin Estes exhibited a large collection of country scenes, some of them being subjects for mirth, such as "Sairy Gamp Awake" and "Sairy Gamp Asleep," "The Angle-us," etc. Gould W. Hart displayed a collection of sixty views, showing a variety of subjects, from babies to a house 130 years old—all interesting and all well done. Virginia V. Titcomb showed a large collection of finely executed portraits, most of the subjects being "characters."

The "Portrait of a Friendless Woman" is pathetic in its suggestions. A year after it was taken the benefactress took a portrait which appears beside the other, and contains a significant revelation of the changes to be brought into the human face by twelve months of mental peace following unnumbered months of misery.

Miss Susie B. Skelding sends to this exhibition a frame containing four photographs that have traits calculated to attract the artist as well as the photographer. In her quartet of pictures Miss Skelding takes a homely out-of-door theme—a load of hay—and makes the simple subject interesting. "Her Pet Kittens" is a subject of another sort.

Another exhibitor, still a photographic novice, but already making conquest of the scientific difficulties, is Miss Lena Rowley, one of the active members of the Brooklyn Woman's Club. Miss Rowley has some interiors as well as some landscapes. One of the former is "In a Studio," while another depicts a phase of "Ironing Day." The Rhode Island coast is the scene of one view.

In another there is a lens sketch of the Summer School at Amherst.

George W. Street had a novelty in stereopticon slides arranged on two sides of a triangular box, with an electric light inside so that the views might be seen well. Other exhibitors were: S. Henderson, twenty pictures; William H. Bedford, nine pictures; W. H. Woodcock, nineteen; Frank A. Butler, twelve; and Gould W. Hart, six lantern slides.

The committee consisted of Professor W. C. Peckham, chairman; Mrs. George W. Banker, A. S. Bedell, H. D. Eggleston, Mrs. Benjamin Estes, J. Foster Flagg, Henry J. Newton, J. C. F. Priest, Mrs. V. C. Titcomb, W. H. Woodcock.

CALIFORNIA CAMERA CLUB.

Marine Day, President Harrison's Visit.

The tug *Active* was chartered by the California Camera Club to follow the President's boat, so that snap shots could be taken of everything on the bay that looked as though it might make a pretty picture. The tug left Folsom street wharf shortly after 11 o'clock. Just before the hawser was cast off E. L. Gifford delivered a humorous address in which he appointed G. W. Reed, Captain of the expedition. This high honor, he said, was due to the fact that Mr. Reed was a seafaring man of experience and bravery, having made trips to Sausalito in safety six times a week for several years past.

It was a perfect morning, the sun blazing hot overhead, and a gauzy haze hanging over the smooth surface of the bay, which, from the wharf, seemed unruffled by the slightest puff of wind. Out in the stream, however, slight ripples broke the level surface, and the ensigns and festal bunting of the *Charleston* and the merchant shipping which lay off Goat Island flapped and fluttered merrily enough to show that the wind was blowing briskly through the Golden Gate.

The *City of Puebla* and the *Charleston* were off Lime Point before the tug reached them, and some of the amateur photographers, who hoped to set the vessels on their dry plates from various positions, were disappointed, as the swell in the Golden Gate set them to gazing over the sides of the tug instead, to the neglect of their slides. It was smoother in Raccoon Straits, however, and not one of the fifty members of the club came back without at least twenty-five exposures.

It was a disappointment that the fire of the guns at Fort Point could not be caught. No one was ready at the first explosion, and by the time they were, the smoke was so dense that the effect was gone.

A square-rigged English ship that came in the Heads under full sail as the procession was going out was caught by nearly every member.

Hospital Cove at Angel Island, Red Rock, and nearly all the yachts and decorated steamers were taken.

Many excellent views of the President's vessel were obtained.

When the *Monterey* was launched the tug did not have a good position, so there will not be much show of this event when the club meets.

The members and their friends on the *Active* were:

T. P. Andrew, George H. Kahn, H. C. Owens, George W. Reed, C. A. Rogers, R. J. Waters, H. B. Hosmer, W. J. Street, James W. Duffy, J. C. Pennie, E. L. Gifford, A. W. Cornwall, J. G. Spaulding, C. C. Pennell, H. E. Poehlman, W. B. Lee, D. L. Randolph, J. A. Newland, C. K. Dempster, J M. Hobbs, O. H. Greenewald, H. J. Lyon, C. A. Haight, Miss S. Haight, Fred. S. Mayhew, T. Schwarin, S. M. Marks, William West, Mr. West, Joseph W. Reid, Mrs. Hosmer, Miss P. Prior, E. L. Gifford, Mrs. Gifford, C. Cormar, Miss K. Martin, E. P. J. F. Young, A. Mullen, W. P. Todd, C. A. Adams, Mrs. George W. Reed, H. C. Cantwell, H. Linsley, J. G. Ils, W. F. Soule, Dr. E. Gray, Professor Burnham, H. Passavant, Miss C. Luhrs, P. H. Muegge, J. W. Harrison, Dr. Harrison, Miss Harrison, A. W. S. Coxhead, A. W. Jones, Miss Harrison, H. Miller, William Metzner, Mrs. William Metzner, Miss E. Fisk, Miss A. Fisk, W. B. Barber, Frank Harold, Mrs. Frank Harold, W. B. Beasley, H. E. Pennell, A. Schwerin, H. Klauber, George H. Swasey, R. P. Burnley, A. L. Dennison, Mrs. J. T. Field, F. E. Smith, J. MacCrosky, H. F. Parrish, Dr. J. H. Hatch, Mrs. J. H. Hatch, C. McKenzie, E. V. S. Moger, Mrs. T. W. Read, Oscar Szontagh, Mrs. W. J. Street, L. D. Radgesky, Miss E. E. Keyes, Mr. Edgeworth, M. B. Ester, Whitney Herr, H. L. Hatch, J. J. B. Argenti, H. I. Howard, Mrs. H. I. Howard, Miss C. M. Howard, C. K. Cormach, Mrs. James K. Prior, James K. Prior.

CASE SCHOOL CAMERA CLUB.

Mr. Percy W. Cobb entertained the members of the Case School Camera Club, Thurs-

day, May 7th, with a demonstration of the toning of albumen prints. He used the acetate of soda bath and ready sensitized paper, besides some paper he sensitized.

The latter gave by far the better tones, besides toning quicker. The respective merits of the different toning baths were discussed. Mr. Cobb also explained, for the benefit of the beginners, the chemical changes which take place in the printing and toning.

The outing held a few days ago was a decided success, and was enjoyed by all.

Under the instruction of Professor H. F. Reid, some of the members had good success in the photographing of the sparks of a Holtz electric machine.

Milton B. Punnett,
Corresponding Secretary.

YONKERS PHOTOGRAPHIC CLUB.

The annual meeting of the Yonkers Photographic Club was held at Hawthorne Hall, Tuesday evening, April 28, 1891.

The following officers were elected for one year: John W. Alexander, President, re-elected; E. D. Gardner, Secretary; George B. Wray, Treasurer. Directors: F. W. R. Eschmann, E. T. Sherman, George B. Ritter and George S. Pentz.

The third annual print exhibition of the club occurs on the second Monday in June. The exhibition is to be competitive, and two ribbon prizes will be awarded in each class. A special prize in each class will be awarded for pictures that are entirely the work of the competitor.

The classes are as follows: A, Landscape; B, Landscape with Figures; C, Animals; D, Marines; E, Genre; F, Portraits; G, Interiors; H, Still Life; I, Hand Camera Work.

It is the intention of the Exhibition Committee to publish a Souvenir Catalogue, and to have it illustrated by six photographs, the work of members, to be reproduced by the half-tone process.

Monday evening, May 18th, Mr. Edwin W. Newcomb of New York, delivered an interesting and instructive lecture before the club, illustrated by the aid of the stereopticon, on "Art in Photography," which was highly appreciated by the members.

The club is in a prosperous condition. The improvements in the dark room, and the additional photographic facilities afforded members, make membership in this organization very desirable for lovers of the captivating art of photography.

On the Increase.—In the World's Fair City new galleries have sprung up so rapidly of late that one can hardly keep track of them. And in every instance the last one seems to spare no expense to outdo all former efforts.

The other day a gentleman who has visited nearly all the first class galleries in the country, said to me, "Have you seen W. G. Root's new gallery?" I replied, "No, I did not know that it was completed." He said, "Yes it is, and open for business, and it is a beauty too, one of the finest in the country." On visiting the place I found the gentleman's statement to be correct. Mr. Root commenced business eighteen years ago, under the guidance of J. F. Ryder, of Cleveland, in whose employ he was for four years, which probably accounts for his systematic business methods. Since he left Mr. Ryder he has had the honor of being with Pool, of Nashville, for six years and Brand, of Chicago, for four years.

His new gallery is located on the seventh and eighth floors of the Kimball Hall building, 243 Wabash avenue, the printing, silvering and bromide room, intended for working a Cooper lantern in, being on the eighth floor.

The building is new, has all the modern improvements, such as electric lights, fine passenger elevator in front, and a freight elevator, run by steam, in the rear.

The gallery was built in accordance with plans furnished by Mr. Root. The parlor is 35 x 18 with a large alcove, which makes a convenient office. Out of this alcove is a door leading to a large finishing room, from which the stairs lead to the printing department.

The dressing rooms have doors connecting them with both the reception and the operating rooms.

All of the rooms are beautifully decorated and tastefully furnished. The ceilings are frescoed in the most artistic manner.

The operating room is 20 x 40 with north sky and side lights after the Hayes patent and furnished with all the modern appliances for making all negatives up to 18 x 22 inches.

As an assurance that his customers are to get the best the art is capable of furnishing, it is only necessary to say that he is supplied with Dallmeyer lenses, and that his prices for cabinets range from $5 to $10 a dozen.

In the rear of the operating room are two good sized rooms, one for changing plates and the other for developing. All the rooms are furnished with electric lights.

Mr. Root is a perfect gentleman as well as

a fine artist, and all of his friends wish him the success that his good taste and energy deserves. RAMBLER.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the Photographic Society of Japan was held in the Masonic Hall, No. 60, Yokohama, on Friday, April 18th. From a little after midday there was an exhibition of prints on the bromide paper that Mr. Cocking had presented to the society a few months ago. Mr. Cocking offered three prizes at the time that he presented the paper, and these were awarded by ballot of members and of the public on Friday. Mr. K. Ogura, amateur photographer, won the first prize, Mr. A. Futami, professional, the second. For the third prize there were so many prints that received an equal number of votes that no decision could be come to at the time of the meeting. It was decided to leave this matter to Mr. Cocking. The members of committee exhibited, but did not compete for prizes, and the work of Mr. C. D. West was particularly admired. There was a set of micro-photographs by Mr. I. Isawa that were considered to show great technical merit. Flash-light photographs taken at various meetings of the society were shown, and some by Mr. Kajima were particularly good.

Mr. K. Ogawa showed a large photograph of the interior of the Russian cathedral in Tokyo. This, as a sample of interior photography, always very difficult, and also as a sample of collotype work, is as fine as anything of the kind that we have seen.

Mr. Cocking showed a large number of "Kodak" cameras. These instruments are highly ingenious, and are excellently made. The larger sizes, which have, we believe, reached Japan for the first time, relieve the instrument from the stigma of being only a toy.

In the evening there was a regular meeting of the society, when Capt. Kenderdine occupied the chair, and the following gentlemen were elected members of the society: Mr. Allan Owston, Mr. A. W. Forbes, Mr. George Brinkworth, Mr. T. H. Tanner, Mr. A. T. Watson, and Mr. J. H. Brooke.

Mr. W. K. Burton gave a demonstration of a modified silver printing process. Briefly put, the process consisted in making one solution of nitrate of silver, and another of "salt" (preferably chloride of ammonium), citric acid, carbonate of soda, and a little gelatine. The solutions are warmed and mixed, when an "emulsion" that is immediately ready for application to any surface that can be sensitized, results. The process of making the emulsion, sensitizing the paper, and toning prints by Clark's platinum method, was shown. Specimens of finished prints were also shown.

Mr. Burton said that the process had not yet been long enough in use to know whether it had any real advantages, but the possible advantages that he saw were that a single solution that would keep fairly well could be prepared in a few minutes, and was at once applicable to any surface, whereas in all other silver printing-out processes, there were either two operations, that of salting and that of sensitizing, or a washed emulsion which was comparatively troublesome to make, had to be used. The process was a cheap one.

Mr. West thought the saving of trouble was not great. So far as he could see, the advantage of the process was that it made it possible to get a blacker color—one more nearly approaching to an "engraving black" than by the ordinary process.

Mr. Kajima made two exposures of the meeting by flash-light.

The proceedings ended with a vote of thanks to the Chairman.

The hall was kindly lent to the society by Mr. O. Keil.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE walls of the rooms of this society are covered with pictures of more than usual interest to lovers of photography, and by judicious changing of the prints at intervals, this interest is constantly maintained. The changes in the large frame of pictures exhibited by C. H. Davis will not fail to exact attention from all who desire to acquire knowledge of the proper use of backgrounds and accessories, and the best use of the skylight.

The regular monthly meeting, held May 12th, was, perhaps, the most instructive and interesting held this session. The minutes being read and confirmed, scientific business was entered upon, the first item being an informal talk by J. Wells Champney. The subject chosen was, "Selection and Rejection in Landscape Photography." Mr. Champney said his remarks would be anything but a lecture, but, that as all were going out soon photographing, he wished to give novices some idea of the principles underlying the method of obtaining an artistic picture. Underlying

all art there are certain principles, and these can help us on. No matter whether the brush or camera is the instrument used, these principles are guides. The idea of making a picture is to adorn the paper or canvas, to make these latter look the better for our efforts. But the facility of taking photographs is so great, that instead of waiting, the idea is to take, regardless of artistic rightness, really destroying plates and paper instead of adorning them. The first principle to be remembered is that the natural picture is a circle, that what is seen by the eye clearly is that which is directly before it, the rest being subservient. Having a high bluff surmounted with a lighthouse by the seashore, several views may be selected. Having friends along, they may be used as factors in the picture. Human interest dominates still-life interest. The eye goes first to the living objects. A thing that moves balances a larger space in the picture than an object inanimate and at rest. If in the near foreground is placed the small figure of a man, occupied, say, in fishing, there is here an important object in relation to the mass of rock, and should this living object be in the wrong place, it would create a considerable difference in the result. Suppose, now, there is a steamer coming from behind the rock, where is this to be in relation to the man and lighthouse? Everything must not be looked at, but those things selected and properly placed that differentiate this landscape from another. Having a 5 x 7 plate, put the lighthouse and rock in the left hand, the man a little to the left of the center, and the steamer to the right of the picture, so that there shall be irregular spacing of the three objects of interest in the picture, giving picturesqueness as opposed to symmetry. Suppose, now, there are clouds, and these are to be included. Besides the spacing interests there is the massing of light and shade to be considered. In this connection, even when using orthochromatic plates, it must be remembered that the values of light and shade with reference to the eye are not the same with reference to the photographic plate. That which appears good to the eye must not be taken as accurate, but the resources and capabilities of the plates must be gauged and worked up to.

Much has been said against double printing, but Mr. Wells Champney knew of no ground upon which this could be utterly condemned. It is no doubt, a matter of use and abuse.

With reference to vertical or rather upright views, too much foreground should be avoided. If mountains are included, avoid the meeting of two in the center of the picture. Again, attention must be paid to the irregular spacing of objects of vital interest and to the massing of the lights and shades. It must be remembered that the water must look flat, the mountains high, and the sky luminous, and so far as we can reach these qualities, in so far the picture is better.

Toward the close of the meeting several slides were shown on the screen and the artisic merits and demerits discussed by Mr. Champney.

The applause following Mr. Champney's remarks having subsided, President Stebbins called upon Professor Cromwell to demonstrate his method of making two pictures of one and the same person upon one plate. This seems to be a very simple process if the Professor's instructions are carried out. Speaking generally, the method is to cover half the field of the lens by a screen placed at a distance in front of the lens equal to the length of focus of the lens. After exposing the one side, cap the lens, change the position of the sitter and repeat the operation on the other side, giving the same exposure. No line of demarcation will be visible. Several lantern slides were shown, and a humorous description by the Professor was keenly appreciated by the audience.

Mr. Stebbins, the President of the society, then read a paper on the action of "Sulphuric Acid on Hydroquinone." He had succeeded in obtaining the hydroquinone mono-sulpho acid of the barium salt, this latter being obtained by digesting hydroquinone at a gentle heat with sulphuric acid, dissolving the caked mass in water and adding barium carbonate. An analysis of the barium salt gave water 2.88 per cent., barium 24.26 per cent., and molecular weight 5.64, this being so near that demanded by the formula as to leave little doubt that the substance is the barium salt of hydroquinone mono-sulpho acid. This salt is readily soluble in water or in dilute alcohol. By decomposing with dilute sulphuric acid the free acid may be obtained. As a developer the results are fairly satisfactory and when a proper formula has been devised better results may be looked for.

Further experiments would be made and the results communicated to the society.

Several hand cameras were exhibited at this stage of the proceedings, the most interesting being the Kamaret. This is the most compact, simplest and neatest camera as yet issued. Weighing only four pounds when

loaded for one hundred pictures and being so small, yet taking 4 x 5 pictures, it will not fail to take with those who desire something that, while being good, is not bulky or complicated. The film is of excellent quality and its insertion may be accomplished by the veriest tyro in a very few minutes. Fitted with a Gundlach lens, carrying an automatic tally and a unique device for telling whether film is exposed or not, it constitutes the nearest approach to perfection yet reached.

The meeting adjourned at a late hour.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—T. G. A. writes : Will you please tell a subscriber to your BULLETIN what is the cause of the stain upon the print which I send with this? It shows itself when I take the print out of the printing frame. I can rub a part of it off from the picture.

A.—This trouble is caused by the use of a negative that has not been thoroughly washed free from hypo, and a slight film of moisture on the paper or else on the negative itself.

Q.—E. V. B. writes : I write you for information regarding the toning bath as given in the O'Neil method in BULLETIN, April 25, 1891. Would like to know if common acetate soda is used, or doubly fused acetate soda, will the bath keep for an indefinite length of time? If so, how much acetate of soda, and how much bicarbonate of soda, should be used each time of toning, also how much of the liquid gold per sheet of paper?

A.—You may take ordinary crystallized sodium acetate if it is pure, but if it has any evidence of color it must be fused. The bath can be used for an indefinite length of time if it is kept clear and free from sediment. All that is necessary is to note the way it tones, and when it becomes slow add a little more gold solution. About 1 grain of gold in solution is needed for one sheet of paper. The bicarbonate of sodium is added only when the bath is not strongly alkaline. Test the bath each time it is used and if it does not turn red litmus paper strongly blue, more bicarbonate must be added.

Q.—T. L. B. writes : Will you please tell me where I can get more explicit directions in regard to the coating of the plate glass on page 228 of the BULLETIN of April 25th?

A.—The glass is coated with a mixture of gelatine and potassium bichromate in the following proportions :

Water	15	ounces.
Gelatine	2½	"
Potash bichromate	100	grains.
Ammonia "	50	"

Melt the gelatine in the water on a hot-water bath at a low heat, then add the two bichromates. Heat the completely melted mixture to 140 degrees Fahr. for ten minutes. Into the mixture, after cooling for a time, add 15 ounces of alcohol and 5 ounces of saturated alcohol solution of borax. Stir the mixture vigorously when adding the alcohol and borax, and continue the stirring till the fluid is clear. Strain through muslin and pour on to the plate. The plate should have a first coat of water-glass, which is diluted with five times its volume of water. Allow this coat to dry thoroughly, then wash it off and dry the plate again.

Q.—W. A. P. writes : I recently obtained some meta-bisulphite of soda, but as many formulas contain the same salt of potassium instead of sodium, I wish that you would kindly tell me how the two differ, or whether they differ at all, as preservators of pyro. Is there any difference in strength or effect? I would also like to ask your "practical" man whether he favors ammonia as an alkali for use in developer, not because "it's English you know," but so many old hands seem to still use it instead of the carbonates. If you approve of the same I wish you would enclose in your reply a handy formula for its use.

A.—There is not enough difference between the two meta-bisulphites you mention to make any material difference in the proportions used in the developer as a preservative. The use of ammonia in the developer is quite rare on this side of the Atlantic and our practical men much prefer to use soda carbonate.

Q.—H. B. writes : Is there any possibility to mount or fasten transparent film negative to a glass plate, so that it may be used like an ordinary glass negative? I prefer films to any plate as far as exposing is concerned, but as to the printing, it is very bothersome to keep them flat. I tried gum-varnish already, but without success. I intend to mount all my films on glass if you know a good way to do it.

A.—Try a mixture of gelatine and chrome alum. Make the gelatine about 20 grains to the ounce and add five grains of chrome alum to it while hot, coat the back of the films with the mixture and squeegee them down on glass, allow to remain under pressure for some hours and they will adhere.

Q.—A. H. W. writes: Kindly inform me through the pages of the BULLETIN if it is possible to obtain one of the actinometers which you describe on page 259 of the last issue?

A.—The actinometer which we describe on the page you mention, is one sent to us specially from England, but we have asked our publishers to import some, and they tell us that this has already been done and that the instruments may be here any day. When they arrive an advertisement of them will appear in the publishers' pages of the BULLETIN.

Views Caught with the Drop Shutter.

THE BAUSCH & LOMB OPTICAL COMPANY, of Rochester, offer a set of prizes to the members of amateur societies for pictures made with either the Rapid Universal lens or the Alvan G. Clark lens. The first prize is $200, the second $125, the third $75, the fourth $50. The Bausch & Lomb Company will furnish the lenses under certain conditions to the various competing societies. These lenses are to become the property of the member in each society producing the best results in instantaneous photography. For further particulars write to the Bausch & Lomb Optical Company, Rochester, N. Y.

THE DOUGLASS & SHUEY COMPANY, of Chicago, are now located in their new quarters, at 11 State Street. W. H. Shuey is President, Gayton A. Douglass is Vice-President, J. C. Leedy, Treasurer, and E. Burton Holmes, Secretary.

OCTAVIANO DE LA MORA, one of our old friends in Mexico City, and an artist of noted ability, has just opened a handsome model studio fitted with all the best modern apparatus. The many medals won by Mr. De La Mora in Europe and America are the best evidence of his skill and artistic abilities. We congratulate our friend on his enterprising spirit and wish him all the success that he so richly deserves.

D. BACHRACH, Jr., writes us that he would warn all photographers to investigate the situation thoroughly in Baltimore before purchasing studios in that city. He says, "There are no paying studios for sale. I speak both as a photographer and as a dealer. As one of the latter it would be to my interest to see changes, but my sense of duty leads me to utter this warning."

J. M. VORHEES' studio in Bay City, Mich., was damaged by fire to the extent of $500 on April 30th.

W. B. SENTEE'S studio at Navasota, Tex., was burned on May 5th. The main building was saved and the rest was fully insured.

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PRINTED ON N. P. A. PENSÉ EXTRA BRILLIANT ALBUMEN PAPER.

A STUDY IN COMPOSITION.

—BY—

ROCKWOOD, NEW YORK.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. JUNE 13, 1891. NO. 11.

ANOTHER NEW DEVELOPER—PARAMIDOPHENOL.

IN a communication to the Société Française de Photographie on May 1st last, MM. Auguste and Louis Lumiere called attention to the fact that Dr. Andresen, who first used eikonogen as a developer, had also made experiments with the phenylene-diamines and amidophenols. With the phenylene-diamines he evidently met with some success and they are included in his patent of April, 1888; but the amidophenols are not mentioned, and it seems probable that with these he met with no favorable results. Without knowledge of Andresen's experiments the Messrs. Lumiere, considering the chemical structure of the amidophenols and noting their close relationship to the phenylene-diamines, and also to the amido-betanaphthol compound, eikonogen, were led to experiment with them as developing agents. As a result of their work they recommend the paramidophenol with sodium sulphite and carbonate as a new and advanced developing agent.

Paramidophenol is derived from phenol, or as it is commonly called carbolic acid, one of the products of the distillation of coal tar. The first step in its preparation is the production of paranitrophenol. This is made by gradually adding one part of carbolic acid to a cooled mixture of two parts of nitric acid having the specific gravity of 1.34 and 4 parts of water. An oil separates which is washed with water by agitation and then distilled with steam. The paranitrophenol remains in the distillation apparatus, and is extracted by boiling with water. On pouring off the water while hot and allowing the solution to cool the paranitrophenol will crystallize in long colorless needles that melt at 114 degrees C and turn red on exposure to the air. From the nitro compound the amidophenol is produced by the action of metallic tin and hydrochloric acid. It crystallizes in thin colorless plates that melt at 184 C. In water it dissolves in the proportion of 1 in 90 and in alcohol 1 in 22 parts. The chemical structure of the paramidophenol is C_6H_4 (OH) (NH_2) and the result of its oxidation in alkaline solution is the production of quinone (not quinol) or quinonimide. The water solution

turns violet-red on exposure to the air, especially in the presence of alkalies, but the addition of sodium sulphite prevents this coloration.

The Messrs. Lumiere give the following formulas for the development of gelatino-bromide of silver dry plates:

Water	1,000
Sulphite of soda	200
Carbonate of soda	100
Paramidophenol	12

Or still better—

Water	1,000
Sulphite of soda	200
Carbonate of lithia	12
Paramidophenol	12

The first formula gives a very energetic developer, and is especially convenient in the development of instantaneous photographs.

The paramidophenol, which acts as a developer, presents the inconvenience of not being very soluble, so that it is not possible to modify the composition of the developer as in the case of pyrogallic acid.

Hydroquinone and eikonogen have, however, this same inconvenience in an equally high degree, and the paramidophenol has the advantage over these latter, especially the hydroquinone, of never discoloring the gelatine.

The solution will last a very long time, even in open-mouthed bottles, and negatives developed with old solution never present that yellow tint that is frequently to be remarked when other developers are used.

The deterioration of the developer is very slow, so much so that in 100 grams of solution six or seven plates 13 x 18 c.m. can be developed without there being the least appreciable difference between the first and the last.

Paramidophenol is expensive, but principally because there are not at present many uses for it, and also because the processes for purifying this agent have not been studied. The substance which is met with commercially under the name of paramidophenol is often very impure; but there is no doubt that on the attention of chemists being directed to its photographic value, this substance will be more easily produced in a state of purity, while, at the same time, its cost will be diminished.

Mons Leon Vidal, the editor of *Le Moniteur de la Photographie*, in Paris, says of this new developing agent: "We have been able to test this developer, from which we have obtained the best results, as well from the point of view of energy as from that of rapidity and durability."

EDITORIAL NOTES.

Orthochromatic photography has been successfully applied to wet plates for some time past by an Austrian photographer of note, M. Jaffe, who sensitizes his plates to yellow rays by coating with

Eosine	2.2 grams.
Alcohol (95 per cent.)	250 c.c.
Cadmium bromide	45 grams.

filtered, after which—

Sulphuric ether	250 c.c.

is added, and after thorough shakings the whole solution is added to

Collodion (2 per cent.).. 1000 c.c.

The sensitizing solution is made up of silver nitrate, concentrated nitric acid and water, and the developer, an iron one, contains also alcohol and sulphuric acid. The time required is about half as long again as for an ordinary collodion plate.

A new camera club has just been organized in Washington, D. C., with a good membership, and four good rooms on the corner of 7th and D streets. The officers elected for the first year were, President, Albert Le Breton; Vice-President, George W. Choate; Secretary and Treasurer, Frank B. Dante.

The recent annual meeting of the American Photographers' Conference closed with a dinner at Clark's, and on the day previous a visit to Brooklyn, where they were most delightfully entertained by the Brooklyn Academy of Photography; being shown, among other views, an original plate, upon which Professor Lippman, of Paris, lately succeeded in photographing the colors of the spectrum, and which he sent to the Conference, with a view to stimulating an interest in researches of the same nature.

Among the prize winners at the Joint Exhibition of the Boston, Philadelphia and New York Societies, recently held at the rooms of the Society of Amateur Photographers of New York, which, by the way, has been a great success, we note among other names the following of well-known aspirants: Robert S. Redfield, Philadelphia; Charles L. Mitchell, M.D., Philadelphia; Frank M. Sutcliffe, England; Adam Diston, North Britain; J. Pattison Gibson, England; H. P. Robinson, England; Martin J. Harding, England; C. Court Cole, England; W. H. Jackson, Denver, Col.; Alfred Steiglitz, New York City; Charles J. Berg, New York City; George A. Nelson, Lowell, Mass.; James L. Breese, New York City; John H. Tarbell, New York City; Edward H. Lincoln, Cambridgeport, Mass.; F. P. Cembreno, England; Richard Keene, England, and Alfred Clements, Philadelphia. Medals were awarded to Miss Catherine Weed Barnes, of Albany, N. Y., Dr. Charles L. Mitchell and George W. Wilson of this city for lantern slides.

The officers of the Baltimore Photographic Club for the year are as follows: President, Harry D. Williar; Vice-President, Frank M. Clotworthy; Treasurer, B. G. Buck; Secretary, Prof. G. L. Smith; Corresponding Secretary, W. C. Farber.

It is of interest to note that in view of the important part photography plays in the criminal records of the country, the Brooklyn City government have established a new position, and the Mayor is to be asked to appoint an official police photographer. We hope to see other cities fall into line without delay.

The latter part of May was devoted by the Boston Camera Club to an exhibition lasting two weeks, at their rooms, a novel feature of which was the fact that all the pictures, some two hundred or more, were for sale, and the proceeds were devoted to the various needs of the club. It is said that one set of four

negatives sold to such an extent as alone to have paid all expenses of the exhibition.

An excellent lantern slide developer called the Gilder developer is made as follows:

A.

Hydroquinone	50 grains.
Phosphate soda	80 "
Sulphite soda	240 "
Water	4 ounces.

B.

Phosphate soda	80 grains.
Carbonate of soda	240 "
Water	4 ounces.

for use, combine equal parts of A and B with one part water—beginning with less of B, and adding the balance as development proceeds.

At the annual meeting of the Photographic Society of Waterbury (Conn.) the following officers were elected for the year: President, H. W. Hayden; Vice-President, S. B. Hill; Treasurer, E. W. Mooning, Jr.; Secretary, Geo. S. Husker.

A good suggestion is before us, from Mr. C. R. Pancoast of this society. To those who have time at their disposal and a desire to own a really good focusing screen, he says: Purchase a piece of what is known as "crystal plate" glass of the proper size and grind the surface with emery, using as a grinder a piece of thick plate glass, say two inches square by three-eighths of an inch thick; in fact, a piece that can be conveniently held in the hand. As emery is hard to get of a uniform grade it is necessary to make it. This may be done as follows: Take a cup filled to one-half with water to which add a quantity of flour emery. Stir well, allow to stand for five minutes, then decant into another cup. Allow this to remain for about five minutes and decant the fluid into a third cup. In each of the cups remains a sediment of emery of various degrees of fineness. Place the plate on a thick piece of cloth or felt and put a portion of the coarsest emery, wet with water on it and with a circular motion of the grinding piece proceed to grind off the surface. Great care must be taken to avoid any deep scratches, and if such by accident should occur they must be carefully ground out. When the surface has been ground over evenly, wash off all traces of the coarse emery and substitute a finer grade and carefully grind the surface. Then wash again and use the finest grade until the surface is almost transparent, finally finish with water. This method, if carefully followed out, will give a plate almost transparent, of exceeding fineness on which the images may be focused with remarkable precision. In copying line work or lantern slides, such a fine surface is indispensable.

We are pleased to note that the United States authorities are at length becoming interested in the numerous "portrait swindles" which have so long been a festering sore in all branches of portrait photography, and that the postal authorities of Chicago have refused to cash the money orders of concerns doing this business, on the ground that they are using the mails to deceive and

defraud. If this decision is sustained, it must have a beneficial effect upon portrait work all over the country. We understand that five different firms who have been advertising to supply life-size crayon portraits free to senders of their photographs, and then delivering the same only when they have inveigled the sender into paying from $6 to $10 for a frame, have been indicted by the grand jury and placed under $1,500 bonds.

A meeting of the Excursion Committee of the Photographic Section of the American Institute was held on May 27, 1891, at the College of Pharmacy of the City of New York. Mr. O. G. Mason was elected Chairman and A. H. Elliott Secretary, the following gentlemen being present : W. I. Lincoln Adams and H. J. Newton. After some discussion, it was decided to have the annual outing during the second week in September, and to take a trip up the Hudson on the Day Line of Steamers as far as Newburgh, returning by the afternoon boat. Dinner to be served at Newburgh. The Secretary was instructed to make the necessary arrangements. This will be a most delightful trip, and further particulars will be published later.

Mr. C. F. Cook, of Wilkesbarre, Pa., in an article received too late for insertion in the "Annual," gives a formula for redevelopment of thin negatives which he has used with great success as follows :

Stock Solution No. 1.

Mercury bichloride	80 grains.
Water	10 ounces.

No. 2.

Iodide potass	50 grains.
Water	6 ounces.

No. 3.

Bromide ammonium	50 grains.
Water	6 ounces.

No. 4.

Hyposulphite of soda—Saturated solution, a few drops at a time, till red precipitate is just redissolved.

First dissolve the mercury and then add Nos. 2, 3 and 4, in order. For redevelopment take of stock solution 1 ounce, and of water 1 ounce, and after thorough washing, proceed as in ordinary developing.

Attention has lately been called to an inexpensive and very useful material for making developing trays, in the shape of Willesden paper, which is extremely light, and being thoroughly waterproof, lends itself admirably to the purpose ; a whole nest of trays weighing no more and occupying no more room than the ordinary tray in use now.

The annual election of the officers of the Department of Photography of the Brooklyn Institute for the present year resulted as follows : President, George H. Cook ; Vice-President, Mr. George W. Banker ; Secretary, Gould W. Hart ; Treasurer, P. F. LeBrun.

It has lately been found that the addition of phosphorus and chlorine to the ordinary materials used in making glass for optical purposes, gives a quality greatly superior to any other yet found, rendering it more transparent and susceptible of a higher polish.

We are in receipt from Miss S. E. Hays, of Denver, Colo., of some fine prints of Western frontier life, which are extremely creditable to the artist.

The idea has prevailed in some minds that if a foreign painting, for instance, were photographed and the photograph copyrighted in this country, any other photographs of the same painting would be infringements of the copyright. Such however is not the case, as it is only that photograph which is copyrighted and protected, the original painting not being affected at all.

A very effective manner of obtaining delicate and beautiful cloud effects is to reflect the view on a black mirror or Claude Lorraine glass, photographing the image there obtained.

We are in receipt of the list of officers of the Auckland Photographic Club for the present year, as follows: President, His Excellency the Earl of Onslow; Vice-Presidents, J. R. Hanna and Josiah Martin ; Hon. Treasurer, G. R. Boulton ; Hon. Secretary, H. J. Carson. A report of the recent exhibition of the club is also in hand, which appears in another column.

We would acknowledge, with thanks, invitations to the recent lantern exhibition of the California Camera Club, and regret that the distance rendered our attendance impossible. The club is about organizing classes in photomicography and bromide printing, under the leadership of gentlemen well fitted to instruct in these subjects.

A new camera club has just organized in Middletown, Conn., by the election of J. Allen Dalzell, President; Charles D. Woods, Secretary, and T. Howard Thompson, Treasurer.

The Camera Club of the University of Pennsylvania gave its first public exhibition in May, to a very large and enthusiastic audience, upward of two hundred views being shown and much enjoyed.

The Sketch Club of Philadelphia, listened to an address by Hermann Faber at its last meeting, the subject being "Photography in Art," in which the speaker denounced the idea that photography had any beneficial effect on art, and spoke in very strong terms against its application to art work, on the ground that it must tend to cripple the fancy, and banish the ideal in art.

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

[*By our Special Correspondent.*]

ENGLISH NOTES.

I AM writing in the last week of May—the "merry month of May," but from the lowering skies and low temperature it might be early in March. On Whit Sunday, May 17th, there was a snowstorm which continued during the greater part of the day; and the Whitsuntide holidays have been completely spoilt by bad weather.

Each succeeding year sees an increasing *rapprochement* between cycling and photography. The number of "wheelmen" who carry cameras is now quite surprising, and there is a perceptible increase in their numbers even since last season. I notice that the cyclists who become converts to photography mostly carry small cameras, quarter plates especially; while the photographers who have added a "wheel," in their case it is usually a tricycle, to their outfit, seem to prefer large size, whole plate, for example.

The recent introduction of pneumatic tires, by which the cyclist practically rides upon a cushion of air, 2 inches in diameter, ought to do much toward increasing the popularity of cycling among the photographers of America. It enables rough roads to be ridden with pleasure; and I would much prefer to ride twenty miles on a pneumatic tired tricycle carrying a whole plate outfit, to walking half that distance with a quarter plate set on my back. It is my opinion that the cycle will soon be regarded almost as an indispensable part of the "kit" of every landscape photographer.

The "Annual" (by which, of course, I mean the "International Annual") is expected in England daily, and from the number of inquiries after the new volume I believe that the entire edition will be snapped up immediately. It seems almost absurd that so beautiful and interesting a volume should be sold at so low a price. It must cost at least double the money to produce it; but Messrs. Anthony have their reward in the knowledge that the cause of photography is thereby advanced both inside and outside the "photo world." Hundreds of copies are purchased in England alone by people who know nothing whatever of photography, simply for the sake of the exquisite illustrations with which the "International Annual" is invariably crowded.

Collodion is about to make a bid for restoration to the favor of camera men. I have already told how a factory is nearly ready at Stechford, near Birmingham, for the manufacture of Dr. Hill Norris's new rapid collodion plates. It is now announced that Mr. J. B. B. Wellington, of London (the newly-appointed manager of the English factory of the Eastman Co.), has succeeded in making collodion dry plates which show 25 on Warnerke's sensitometer; and lastly, the news comes from Berlin that Dr. E. Vogel has achieved a like success. But I fear that the price will be an obstacle, for, so far as I can learn, the cost of manufacture of the Norris plates will be such that their selling price must be double that of gelatine plates.

Studying, recently, the history of the discovery of alkaline development, I satisfied myself that it had its foundation in the work done by Mr. H. T. Anthony, of New York, in and before the year 1862. First of all he discovered the advantages which result (in the dry climate of the States at all events) from fuming silver-sensitized paper with ammonia before printing. He then applied the same method to dry collodion plates, with the result of greatly diminishing

the average exposure, by his permission the plan was published by Mr. E. Borda, in the *American Journal of Photography* for 1862. The news soon reached England, and Anthony's experiments were repeated by Glover in Liverpool, and by Leahy in Dublin ; but the latter went a step further, and applied the ammonia in the liquid form. Then Major Russell took the matter up ; he discovered the necessity for a restrainer, and introduced the soluble bromides for this purpose. His work in 1863 completed the matter ; and from that time the alkaline pyro developer, plus a bromide, has been recognized as the best developer for dry-plates generally. It is pleasing to think that the best workers in the Old and New Worlds co operated in making so important an advance as the change from acid to alkaline development proved to be.

The first excursion of a provincial society to which I belong was held the other day and some account of the outing may be interesting for comparison with your doings on the other side of the herring-pond. Saturday afternoon was the time fixed upon, and the party (about thirty in number) took train to a pretty village which was reached in a run of less than half-an-hour. A printed programme had been previously distributed in which all the points of interest along the line of route were indicated, and the camera-carriers speedily "spread themselves out" like a pack of fox-hounds; the difference being that the objects of pursuit were almost numberless, and that they "couldn't run away." Churches make capital sitters! There is generally enough work to be done in and around a time-worn ivy-covered English church to last an active worker for a whole day; but the village we attacked possessed also such food for the lens as an ancient manor-house, thatched cottages, a blacksmith's smithy, etc. An hour or two passed only too quickly, and then the leader's bugle summoned the party to depart. A four-mile walk ensued through a country just bursting into spring, with fields full of sheep and cattle, across old stone bridges, and by antique moated farm-houses. There was indeed an *embarras des richesse*, and by the time a second village was reached every one's dark-slides contained exposed plates only. One member—new to the craft—exulted in the possession of a roll-holder, which he used that day for the first time ; but he was somewhat disconcerted on finding that owing to the excitement and hurry of the occasion he had "omitted one of the motions," and had taken fourteen beautiful pictures upon one and the same piece of film ! Provision had been made for charging plates at village No. 2, and there was provision of another kind provided at the commodious inn where the party sat down to high tea. After tea several "groups" of the party were taken in the grand old garden adjoining the inn as mementos of the day ; and a rush was then made for the train, the party returning by a different line from that by which their outward journey was accomplished, thus avoiding any necessity for passing twice over the same ground. On all such excursions a prize (enlargement from the winning negative) is offered by the society for the best picture taken during the trip; and members are expected to bring prints from all their negatives to the club-rooms for comparison and consideration.

Such excursions do good in many ways; and the society in question holds six during each season. On each trip a leader is appointed, who has to draw up a programme, visit the district beforehand, and make all arrangements. Some of the excursions take up a whole day; others half a day only. At one time long railway journeys to places hundreds of miles distant were in favor; but of late years much shorter trips have been preferred, especially as the society

is engaged in the task (which ought to be considered an imperative duty by every photographic society) of making a "photo-survey" of the country in which its headquarters are situated.

The few exposures which I made during the little outing described above were all shots from a hand camera with a shutter working at about the one-thirtieth of a second. As the day was dull I felt pretty certain that all the plates were under-exposed, and I took the opportunity to test the value of different developers for this class of work. Hydroquinone with caustic soda may be a powerful developer; but all it produced from these "shots" were hard black and white negatives. Pyro with carbonate of potash did much better, giving fair half-tones; but the best results were obtained with pyro and ammonia. This exactly confirms my former experience with these developers. But for plates which are known to be over-exposed hydroquinone is a valuable developer.

While I write the rain continues to pour; the thermometer stands at 40 degrees Fahr., and if any out-of-door work is to be done it must be by the aid of a "big flash-light!" But what is fun to the amateur is death to the professional, and their complaints of the unseasonable weather are both loud and deep. Is it possible that the "McKinley Tariff" prevents the bad weather from entering the United States, and so sends it (along with the paupers, lunatics, etc.), back to Europe? Among those who cannot otherwise account for the superfluity here is

TALBOT ARCHER.

THE ACTION OF LIGHT ON SILVER CHLORIDE.

BY ROMYN HITCHCOCK.

[Read before New York Camera Club.]

AT the Toronto meeting of the American Association for the Advancement of Science, August, 1889, I presented the results of some preliminary investigations on the action of light on silver chloride.* Very finely divided silver chloride was allowed to deposit in extremely thin films upon thin plates of microscope cover glass. After thorough washing these were weighed and four of them were placed in a tube connected with a hydrogen apparatus and exposed to sunlight during one day, while the undried gas was passed constantly over them. The issuing gas was conducted through tubes containing solution of silver nitrate. The object of this experiment was to determine the loss of weight suffered by the chloride in sunlight, and also to collect the chlorine set free, in order to discover whether the chlorine collected in the nitrate tubes was equal to the loss in weight of the slips. Although it has long been held by observers that no loss in weight could be observed when silver chloride is exposed to light, it was thought that by using finely divided chloride in very thin films an appreciable loss would be detected, and if, as has been supposed, an oxychloride is formed, this fact would be indicated by finding an excess of chlorine in the nitrate tubes over the loss observed.

The result of this experiment showed a loss in weight equal to 4.9 per cent. of the chloride used, and there was a close agreement between this loss and the weight of chlorine collected.

*See "American Chemical Journal," Vol. XI, No. 7.

Two other slips were exposed to sunlight without the hydrogen for a longer time and the loss in weight amounted to 6 and 6.2 per cent. respectively.

These surprising results fully established the fact that a very considerable part of the chlorine of silver chloride is set free by the action of light, and that the reason for the hitherto discordant results is to be found in the fact, fully established by incidental observations in the course of these experiments, that the action of light upon masses of silver chloride is only superficial. It was also found in the course of these investigations that the chloride, after the action of light, yielded abundance of silver when treated with dilute nitric acid. This conclusion is directly at variance with the results of most previous observers, but it has since been fully substantiated, as will be seen.

Coming now to more recent experiments, a series of five thin glass slips numbered as below, coated in the manner described, were exposed under glass for about four months and weighed from time to time. The course of the decomposition may be followed from the records given in the tables below:

TABLE I.

Weights of slips and slips coated with AgCl, before exposure to light.

	Glass Slips.	Slips and AgCl.	Wt. of AgCl Feb. 7th.
I.	.41058	.43680	.02622
II.	.41051	.43437	.02386
III.	.41452	.44273	.02821
VI.*	.56131	.60112	.03981
IX.*	.63388	.67537	.04149
		Total	0.15959

TABLE II.

Weights after exposure.

	Feb. 11th.	Feb. 13th.	Feb. 20th.	July 12th.	Aug. 25th.
I.	.43576	.43542	.43529	.43504	.43491
II.	.43318	.43285	.43270	.43256	.43241
III.	.44143	.44098	.44083	.44053	.44041
VI.	.59948	.59882	.59858	.59764	.59743
IX.	.67401	.67342	.67306	.67181	.67130(?)

TABLE III.

Showing loss in weight from weighings in Table II, calculated for 0.1 gram of AgCl.

	Feb. 11th.	Feb. 13th.	Feb. 20th.	July 12th.	Aug. 24th.
I.	.00396	.00526	.00575	.00671	.00720
II.	.00498	.00637	.00700	.00758	.00821
III.	.00468	.00620	.00673	.00779	.00822
VI.	.00414	.09575	.00638	.00874	.00929
IX.	.00327	.00470	.00556	.00858	.00989(?)

Up to February 20th, the slips I and IX show a noticeably smaller loss than the others. This was owing to unequal exposure of these slips to light. This error was subsequently corrected, but the next weighings of these two slips showed that they had not caught up to the others. The last weighings of slip IX showed an excessive loss, due perhaps to some mechanical injury to the film.

It is obvious from these figures that there is a continuous dissociation of silver and chlorine under the influence of light through a long period of time. It may be positively asserted that the action would have gone further had more time been given. But I was obliged to stop the experiment at this point on account of leaving home for a time, and this article is written at sea while

* Slips VI and IX were larger than the others.

the author is en route to the Celestial Empire. Much to his regret, it will be impossible to continue the research for some time to come; but it is hoped the opportunity will be offered to complete the work in future. Such work cannot be regarded as complete until the composition of the product of the final action of light is obtained and its composition accurately determined. It would be surprising when we consider the literature of this subject, if it should prove that complete dissociation of silver chloride results from the action of light. These experiments indicate the possibility of such a conclusion; but whether it will be possible to effect such a perfect decomposition in practice is perhaps doubtful. It will depend upon the practicability of producing and working with silver chloride in the finest possible state of subdivision, so that the light can act upon each individual molecule, and the weighing of such films involves the utmost delicacy and care. One-third of the total chlorine of the fresh chloride has been separated in these experiments, and the action was certainly not complete.

The compound, or rather the mixture, as I am disposed to regard it, of AgCl + Ag, resulting from the action of light, was subjected to analysis. First, the precipitated chloride on the bottom and sides of the precipitating jar, after long exposure to sunlight, was scraped off and examined by treating it with warm, dilute nitric acid. The silver thus dissolved was precipitated and weighed as chloride. The results are as follows:

AgCl, darkened by light	0.10141
AgCl, from nitric acid solution	0.03031
Corresponding to Cl	0.0075

The weight of the original white chloride was not known, but the dissolved silver obviously represents a loss of chlorine of about 7 per cent., which corresponds very well with the results shown in Table III, July 12th, about the time this determination was made.

The five slips, after the final weighing on August 25th, were treated with dilute warm nitric acid and the dissolved silver determined as chloride. As I was obliged to leave before this determination was finished, I am indebted to Dr. W. Hallock for collecting and weighing the precipitate. Dr. Hallock found the precipitate to weigh 0.05588 grams, equivalent to 0.01382 of chlorine. From Table II, August 25th, we find the total loss of chlorine on the five slips to be 0.01393, which is perhaps excessive by reason of including slip IX, as already explained. The error, however, cannot exceed 0.2–0.3 milligram. The agreement of the numbers 0.01382 and 0.01393 shows clearly that the silver dissolved by nitric acid is the equivalent of the chlorine lost by exposure to light.

As a general summary of results we have

Original weight of AgCl (white)	0.15959
Weight of Cl lost in sunlight	0.01393
Percentage of loss	8.57
Silver rendered soluble in HNO_3	0.04205
Cl equivalent of silver thus dissolved	0.01382
Weight of discolored AgCl	0.14566
Silver soluble in HNO_3	0.04205
Percentage of soluble silver	28.8

If the discolored chloride were a definite compound, which it certainly is not, the proportion of its two constituents would be approximately represented by the formula $(AgCl)_2Ag$.

The weighings were all made on a very delicate Bunge balance, for the use of which I am indebted to Dr. Carl Barns, of the laboratory of the U. S. Geological Survey.

WASHINGTON, D. C., U. S. A.

FIXING.

BY A. H. ELLIOTT, PH. D.

[Informal talk before New York Camera Club.]

THE problem of separating the undecomposed silver haloids from the developed picture on the glass plate and also on the printed silver paper, was one of the first difficulties encountered by the earliest workers in photographic processes.

It would be out of place in an informal talk like that assigned to me to-night to attempt to give in detail all the various methods of separating the undecomposed silver compounds from the photographic image. But before saying anything about the fixing methods now in use, it will be well to take note of the character of the work to be accomplished and the various difficulties that have to be overcome to insure success.

In the case of the gelatine plate we have a film composed of silver bromide, together with silver iodide, or sometimes silver chloride, held in place by an organic substance. When the image is developed we have in addition metallic silver. The structure of this image must also be remembered. Where the image is densest the amount of metallic silver is greatest, and this becomes less and less till at those points where there is no darkening of the film there is no metallic silver in the coating on the plate. Looking at this from another point of view we see that the amount of undecomposed silver compounds in the film will be least at those points where the metallic silver is greatest. From these considerations it appears that when the undecomposed silver haloids are dissolved the film will consist of a kind of sponge composed of gelatine and metallic silver, consisting of much silver when the image is densest and shading off till it contains only gelatine. Where the finest deposit of silver occurs on the film it is an infinitely small amount supported on the surface of the porous gelatine.

What I have said about the gelatine plate is equally true of the albumen paper used for printing.

The problem of fixing consists then of dissolving out the undecomposed silver haloids from this mixture with metallic silver without damaging the fine details of the image upon the surface of the gelatine that carries it. The substances that we may use for the solution of the silver haloids must not disturb the fine network of the gelatine that holds them, or the image will be correspondingly disturbed and the fine details will be destroyed.

The silver haloids dissolve in a large number of solutions of other substances, but there are few of them that fulfill all the conditions necessary for the preservation of the developed image. The following are some of the solvents of silver haloids, etc.:

Silver Bromide.—Soluble in potassium and sodium bromides and chlorides, ammonium chloride, potassium iodide gives AgI which dissolves, ammonium

hydrate, mercuric nitrate, potassium and sodium hyposulphites, also potassium cyanide.

Silver Iodide.—Soluble in potassium and sodium chloride, and in the iodides of potassium, sodium, calcium, strontium, barium and magnesium. Also in potassium cyanide, mercuric nitrate and silver nitrate. The hyposulphites of potassium and sodium dissolve it, but somewhat sparingly.

Silver Chloride.—Soluble in the chlorides of sodium, potassium, calcium, strontium, barium, magnesium, ammonium and mercury. Also in the nitrates of sodium, potassium, calcium, magnesium, ammonium and mercury. In potassium cyanide. In the hyposulphites of potassium and sodium, and also in the sulphites of the same metals. Silver chloride is also soluble in ammonium hydrate. In methyl and amylamines, and in sinamine and thiosinamine. It is also soluble to a slight extent in potassium carbonate.

In addition to the above, ammonium carbonate dissolves silver chloride and potassium ferrocyanide converts it into silver cyanide, which afterwards dissolves. Sulphocyanides of potassium and sodium also dissolve the silver haloids and in the same manner as the chlorides.

Of all the solvents mentioned only a very few are available for the service of the photographer. Among the first to be used was the chloride of sodium, common salt. A strong solution of brine was first used by Daguerre in fixing the image on his plate. He also used a solution of ammonium hydrate. But he soon found that the salt solution worked too slow and the ammonia damaged the image. It was some time before this that Sir John Herschel had noted the extreme solubility of the silver haloids in hyposulphite of sodium, and Daguerre adopted it as a fixing agent.

Fox-Talbot in his calotype process, which consisted in the reproduction of pictures on paper, used solutions of the bromides of sodium or potassium. But he also afterward used hyposulphites and tried to get a patent on their use. This was, of course, denied, because Herschel had discovered their property of dissolving the silver compounds some twenty odd years before.

The well-known chemist, Liebig, first noted the solubility of the silver haloids in potassium cyanide, but who first used them in photography does not appear to be definitely known. Gaudin used it for fixing collodion plates in 1853.

Sulphocyanide of ammonium was proposed as a fixing agent in 1863 by Meynier.

In the year 1885 Captain Abney proposed the use of sodium sulphite.

Such in as few words as possible is the history of the subject of fixing to-day.

Practically only two substances are used by photographers to fix their plates or prints, *i. e.*, potassium cyanide and sodium hyposulphite.

Potassium cyanide is not good for gelatine, because it is strongly alkaline and acts on and dissolves the film. It is also objectionable on account of its poisonous character. It is very valuable on collodion plates, and is generally used in that process. But even in the case of collodion, too strong a solution of cyanide will spoil the finer details of the image. Twenty-five grains to the ounce is a good strength.

It must be much weaker than this if used on gelatine plates.

The use of sodium sulphite as a fixing agent was proposed by Abney to obviate the difficulties of the decomposition of hyposulphite. He uses it for silver prints, and its action depends on the action of sodium sulphite on silver chlor-

ide. This action gives sulphite of silver, which dissolves in sodium sulphite. As the solubility of the chloride is small compared with its solubility in hyposulphite, Abney recommends the use of two baths of a strength of 1 in 5, and made acid with sulphuric acid. The prints are left in the first bath for 15 minutes and then put in the second bath for 10 minutes more. They are washed in a few changes of water and are permanent. When using the sulphite bath the toning of the prints should be carried further than when hypo is used, as there is no strengthening from sulphuration. One ounce of hypo will fix three sheets of paper 18 x 22, while 1 ounce of sulphite will only fix half a sheet. That is when these are dissolved in the proportion of 1 in 5.

We now come to the use of sodium hyposulphite as a fixing agent. And to be honest, I do not know that I can tell much that is new. All that I may hope to do is to call attention to some of the precautions to be taken in using hypo and the philosophy of the process.

If you take a solution of silver nitrate and add it to a small quantity of a solution of sodium hyposulphite, you will get a precipitate of silver hyposulphite, which is of a gray color. If you now add to this precipitate of silver hyposulphite some more sodium hyposulphite the precipitate will dissolve to a perfectly clear solution.

This is the course of events in the fixing of a negative. The first step is the conversion of the silver haloid into silver hyposulphite while a bromide and iodide of sodium is formed at the same time. The silver hyposulphite unites with some more of the sodium hyposulphite, to form a double salt of silver and sodium hyposulphite, but this is not readily soluble in water. It is, therefore, necessary to have some more hyposulphite present to insure its solution, the hyposulphite being the best solvent for the silver and sodium double salt.

In fixing with hypo it is best to have two baths to insure a perfect solution of the double hyposulphite compound. If this salt is not perfectly dissolved it will not be washed out of the film with water, and as a consequence of its presence in the film stains will appear. These stains may take months to develop, but there is no way to get rid of them when once they are on the negative. They are the result of the decomposition of the silver hyposulphite and the formation of silver sulphide in the film. The greatest care should therefore be taken that the bath is not nearly saturated with silver hyposulphite and that the negative is allowed to remain in the bath a sufficient length of time. Always remember that you have not only to convert the haloids into hyposulphite of silver and to form a double salt, but you must have enough hypo present to dissolve the double salt after it is formed.

In fixing prints it is a common mistake to use hypo that is too strong. Under these circumstances the image suffers from the breaking down of the details in the fine half tones. The use of ammonia should also be very carefully watched in the hypo bath for fixing prints. It will surely attack the fine shadows if it is used in any but the smallest quantities.

Ammonia also dissolves the albumen off the paper.

After a few remarks on hypo eliminators and a recommendation of acid-sulphite for the purpose, a discussion of the question of "fixing" followed.

"You want more exercise." "But, doctor, I am a letter-carrier." "Then you need rest. Join the police force."

[*Written for "International Annual."—Received too late.*]

HOW IT CAME ABOUT.

BY JEX BARDWELL.

Some time ago in my readings I had noticed a recommendation to add a small quantity of bisulphite of soda to the hypo bath for the purpose of giving a better color to the negative and as a preventive of stains and yellow discoloration, and, on trial, I was pleased with it and continued its use until the acid sulphite was put on the market, since which time I have used that. About a year ago this happened : One day after doing my printing, and having but a few more prints to make, I deferred them till next day, but when morning came I was called away on a journey, and on coming back I looked over the prints that had been left and noticed that as they had become but slightly discolored I thought I would tone them, and when about to put into the hypo bath I bethought me if the acid sulphite is so good for removing the yellow color from a negative, why not try it on these prints, which I did, and the prints were so satisfactory both in color and tone, that I continued the practice of its use. On thinking over the subject I could not then see any reason why it should be hurtful to the prints. My work is landscape, mostly stereoscopic, and I have prints in stock that were made all through last spring and summer, and they are now as clear, pure, and of as good tone as when first finished, and from my experience I have no hesitation in saying that by mixing a small quantity (half that recommended for negatives) of the acid sulphite with your hypo and not using it a second time, that you will have better tones and clearer prints than you will get by using plain hypo or hypo with ammonia or carbonate of soda, as is sometimes recommended.. I know that many will hold up their hands in holy horror at the idea of using an acid hypo bath ; but just try it.

[*Written for "International Annual."—Received too late.*]

PRESS PHOTOGRAPHY.

BY W. H. BENNETT.

It is an antiquated newspaper office that does not possess a camera at the present day. Every member of the staff from the editor-in-chief to the office boy recognizes the important part played by "Anthony's Detective" in the make-up of the daily newspaper, and moreover, knows something about manipulating the little machine. "Negative," "Silver print," and similar terms have taken their places permanently in the newspaper man's every day vocabulary. The camera is a newcomer, however, in the sanctum, and the photographic pioneers in newspaperdom have some queer tales to tell of their experiences with superiors who were not in the early days aware that there were certain limits beyond which the art of photography could not go.

A friend of mine, a member of the city staff of a metropolitan daily, who possessed a camera, and had achieved considerable success in illustrating his stories with pictures caught on the fly, was summoned to the desk by his chief, one afternoon.

"Snapem, there is to be a big wedding in Grace Church to-night. The Vandervoort-Vandergriff nuptials. I wish you would take a run up to the church and get a snap-shot at the bride and groom as they walk toward the door.

"Couldn't possibly do it. There would not be enough light in the building."

"Umph," and the chief looked at poor Snapem as if he was not quite certain whether he was endeavoring to wriggle out of an assignment, or whether he didn't know quite as much about photography as he pretended. At length a bright idea struck him. "See here, Snapem, what is the matter with taking the photo by flash-light?"

The bare idea of snapping a magnesium cartridge in the faces of the happy couple in the crowded church caused a cold chill to circulate around Snapem's vertebral column.

He explained that in order to obtain the slightest result it would be necessary to use considerable magnesium, and then the smoke—danger of a panic—likelihood of his being entirely misunderstood and arrested as a discarded lover who sought revenge by shooting the happy husband, etc., but the chief would not see the point, and a big black mark was scored down in the tablets of his memory against the unfortunate Snapem.

Another day poor Snapem got in disgrace because he could not secure a snap-shot negative of a fire engine, dashing along the avenues by moonlight.

Poor fellow, he laughs now as he recounts some of his misadventures, but he felt depressed often enough during the days that his chief was educating himself in photography.

Another of my friends tells me that he is seeking some way of entirely changing his personal appearance.

"You see I take a great number of negatives for my paper every week. Now people treat me kindly—arrange groups for me—disturb their every day routine to enable me to get a negative, and as I am about leaving they will say, 'Now, Mr. Dryplate, I hope you will send us a print or two when you can.' Of course, I am full of gratitude for their kindness and promise to send the prints. In consequence, to quote the words of a popular ditty 'they're after me' about 300 strong. I never make the prints, hav'nt time, and if I turned the negatives over to a photographer to make prints for my friends, I would be compelled to turn over my pay envelope with its contents intact to him every week, and still be in his debt. Now when I go out, I am buttonholed by every second man I meet, who inquires 'Where are those photos you promised me?' I'm tired of it."

In writing up the commencement exercises of a High School, recently, one of our camera knights took a group of the sweet girl graduates by flash-light. He developed his plates and handed them in to the city editor for transmission to the artist.

"See here, Mr. Dropshutter," said the editor "you have evidently made some mistake. I told you to take a photograph of the graduating class at the High School. Instead of that you have mistaken the place, and have secured a group of girls in the Blind Asylum."

"Oh, no I did not. What makes you think so?"

"Why because every mother's daughter of them has her eyes hermetically sealed."

Outdoor photography in a crowd is the joy of the photographer's life. A fine opportunity once offered itself to secure a good picture of the Rev. Dr. Talmage, mounted on a fine horse and arrayed in his uniform as Chaplain of the Thirteenth Regiment of Brooklyn.

I snapped him!

When the plate was developed I discovered that some vandal had shoved his clinched fist in front of the lens; the dominie's horse had disappeared, and the popular preacher seemed to be struggling in the grasp of a giant. Frequently you will encounter people who manifest an uncontrollable desire to get their eye glued to the lens and glare into it while uncapped. Many of them may be swayed by the same impulse to perpetrate a joke that moved William J. Florence and the lamented Barney Williams.

Williams had a summer home at Bath, L. I., known as Kathleen Villa, where he entertained many brother actors during the summer vacation. Bath was not a fashionable resort, and the Thespians wandered around the place in rough-and-ready attire. There was a picnic ground not far from Kathleen Villa, and one of its attractions was an itinerant photographer. One day two rustic-looking customers entered the grounds and made a bargain with the photographer to take their portraits. He posed them, arranged his camera, and uncapped the lens. What was his horror at seeing his two subjects start on a gallop for the camera and indulge in a bumping of heads and a jostling of persons in their effort to explore the interior of the camera through the lens. It was one of Billy Florence's and Barney Williams' little jokes. The portraits were not true to life.

[*Written for "International Annual."—Received too late.*]

ON SUNDRY USES OF HOWARD FARMER'S REDUCING SOLUTION.

By W. K. Burton, *Imperial University, Japan.*

The above-mentioned solution, a mixture of a solution of hyposulphite of soda and of another of ferri-cyanide of potassium (red prussiate of potash) is very well known for the reduction of negatives, but its other uses, although they have been published, have not had the attention that they should have. This reducer, if properly used, is, in my hands at least, by far the most efficient reducer of over-printed or over-developed proofs by any silver-printing process. This was brought forcibly home to me the other day.

I had prepared a set of prints on different kinds of paper to illustrate at a meeting of the Photographic Society of Japan a modified silver-printing process, of which I have sent a description to the London Camera Club. Those who have tried experiments in silver printing by various processes will know that, using the same process, prints will often darken more in drying, when prepared on one kind of paper than when prepared on another. In this special case several of the prints turned out considerably too dark, and there was no time to prepare more paper. I at once decided to try reduction by the Howard Farmer process, but without great hope of success, and that for two reasons. The first is that I have generally found that it is essential, to secure even action of the reducer, to use it before the plate or print to be reduced has dried after fixing, and the second was that the prints had been toned by Clark's platinum process, and I doubted if reduction would take place at all, as the reducing solution will certainly not act on metallic platinum. I, however, made up a considerable quantity of a ten-per-cent. solution of hyposulphite of soda, and to this added a few drops only of a saturated solution of red prussiate of potash. The prints were well soaked in

water, and were then passed into the reducing solution. To my great delight the reduction took place slowly, but with perfect regularity.

This is an exceptional case, because, as I have said, I have found it to be desirable, in the case of prints at least, that reduction should be performed before drying. This is especially the case with "bromide prints." Indeed, by whatever silver process a print is made, if it be found desirable that it should be reduced, the reduction should take place immediately after fixing, the print being taken direct from the fixing bath to the reducing bath. Another thing to be observed is that very little red prussiate of potash should be used. A solution that is of the strength desirable, and indeed necessary, for the reduction of negatives, will nearly obliterate many kinds of silver prints in a few seconds. If the action is too slow, a little more of the red prussiate of potash solution can be added, the prints being at the time, of course, taken from the bath.

In the case of negatives that will give only flat and unsatisfactory prints, working by any of the ordinary processes, it is often possible to get quite bright prints by much overdoing in the printing frames, and reducing after fixing.

In the case of reducing negatives there is not the same tendency that there is, in the case of prints, to an unequal action of the reducer, if the film has been dried, but in the case of negatives, as well as prints, by far the best time for reduction is undoubtedly immediately after fixing.

[*From Photographische Rundschau.*]

WORKING WITH ORTHOSKIAGRAPHIC (ORTHOCHROMATIC) PLATES.

BY L. DAVID AND CH. SCOLIK.

ALTHOUGH we have to take into consideration that the action of pigments (artificial colors) is not the same as that of the spectrum colors*, in spite of their apparent similarity, the former are reproduced in almost correct proportion of brightness through color sensitive plates by application of yellow glasses. The advantages offered hereby are shown most distinctly in the reproduction of colored paintings. In former times it was not possible to reproduce all the colors in their correct proportion of brightness. To make a photographic copy of some celebrated oil painting, copies had to be made first, painted in gray, and in which the light and shadow values were kept in exact proportion to the effect which the original exercised upon the eye. But since the production of plates which were sensitive to yellow, orange, and even red, while at the same time the energetic action of blue and violet can be reduced by the insertion of yellow glasses of different brightness, this expensive remedy has become super-

*The difference has its reason in the optical composition of the coloring matters, which, according to their condition, absorb certain colors and reflect others, furnishing therefore optically mixed color rays. The photographic action of each pigment is, therefore, in proportion to its composition, and it can by no means be asserted that each yellow should be rendered black in the photographic reproduction by ordinary plates, and each blue in the same way always white. It may, for instance, be mentioned, that Naples yellow, which contains in its mixture much blue, shows light in the photographic picture, while chrome yellow, which in reality appears much lighter than the former, shows very dark. Just as different is the action of the blue tones, of which cobalt blue, although it contains red, comes lightest; and indigo and Berlin blue, on the contrary, much darker. Of the red colors, vermilion and chrome red become very dark; kropplack, on the contrary, which contains a mixture of blue and red, appears light. Brown tones come always dark. With green colors the photographic action is greater or less, according to the respective coloring matter containing more or less blue.

fluous, and it is surprising how even old and darkened paintings can be reproduced in completely correct shades by means of the orthoskiagraphic process.

The value of this process is also confirmed by reproductions from photographs, its application rendering the paper grain (at times so disturbing), almost invisible. Landscapes taken on orthoskiagraphic plates are handsomer and much more correct than those taken on ordinary plates, which let the green appear too dark and the blue horizon too indefinite. With orthoskiagraphic plates and by application of a yellow glass the distance takes a clearer form, trees, foliage, shadows and foreground have more detail, and the whole picture generally has a more harmonious appearance. Orthoskiagraphic plates are not less to be preferred to ordinary ones for interiors, particularly with regard to dark colored furniture (red or blue velvet, etc.,) and dark decorations with gold ornamentation or blue lines upon white ground, etc. For portrait views upon orthoskiagraphic plates there is considerably less retouching required than for ordinary plates, which will bring to light the yellow spots and other defects of the skin greatly more distinct than they appear in reality and reproduce the yellow tint, peculiar to some people, much too dark; blond hair almost brown, red black, and blue eyes too light and indistinct. The same is the case with costumes, whose colors are reproduced more correctly in their shading with the orthoskiagraphic plate.

A further great advantage of the orthoskiagraphic process is that a very high sensitiveness to yellow light can be given to the plates, when artificial light is used for interiors, reproductions, and even portraits.

The sensitiveness of the orthoskiagraphic plates (particularly those bathed in erythrosin-ammonia) for white light is analogous to that of the ordinary plate, or at least not much less. The time of exposure depends upon the condition of light and the intensity of the light reflected from the objects in question, and is also according to the lighter or darker coloration of the yellow glass, which is inserted behind the objective or between its lenses. The yellow glass is selected according to the colors of the picture to be taken, and in proportion to the color sensitiveness of the plate. In exceptional cases the yellow glass is quite superfluous. The insertion of the yellow color-filter can take place after focusing, but it is necessary to focus again sharply to prevent any defects. When yellow glasses are used it is preferable to focus with these at once. Yellow colored glass coated with yellow colored collodion or yellow colored gelatine, is used as a color filter. Small glass baths, filled with a solution of aurantia or chromate of potassium can also be used in place of yellow glasses. Lately films are produced of yellow colored strong collodion, which are pasted over the diaphragm opening. If the views are taken by electric light the yellow glass is not fixed to the objective, but is moved in front of the lamp after focusing, so that the object itself has a yellow illumination. Dr. Mallman and others tried also to take views in yellow magnesium flash-light, and succeeded excellently.

During developing it should be principally considered that the orthoskiagraphic plates are much more sensitive to the red dark-room light than ordinary ones. The further treatment of orthoskiagraphic plates differs not in the least from the ordinary process. In the following we shall recapitulate all particulars and leave nothing unmentioned which is of any practical importance, and about which we can speak from our own experience.

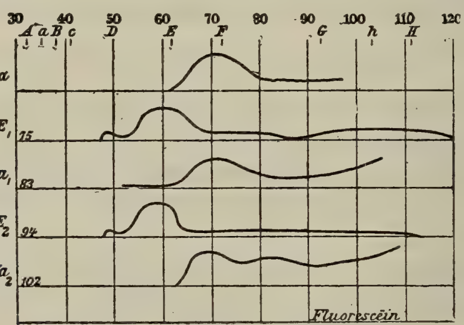
(*To be continued.*)

THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES.

BY J. J. ACWORTH, PH.D., F.I.C., ETC.

(*Continued.*)

Fluorescein, $C_{20}H_{12}O_5$.—This dye is fairly soluble in a mixture of alcohol and water, and forms a precipitate only with difficulty with $AgNO_3$. In gelatine the dye shows a considerable absorption throughout the visible spectrum—it appears to commence slightly at *a*. At *E* it begins to rise considerably and reaches its great maximum on both sides of *F*, again decreasing toward the more refrangible end of the spectrum, but with continuous absorption throughout, according to the amount of dye present. For sensitizing AgBr emulsion I used quantities of fluorescein, dissolved in alcohol and water, varying from .03 to .200 gram for every 2 grams of AgBr present. Ammonia was added in all cases. The sensitizing action with the lesser amount of dye first appears as a small band at just before *D*, then becoming almost nothing, but afterward again rising rapidly to its great maximum of sensitizing action at $D\frac{4}{5}E$; at *E* it gradu-



For explanation of drawings see foot note page 267.

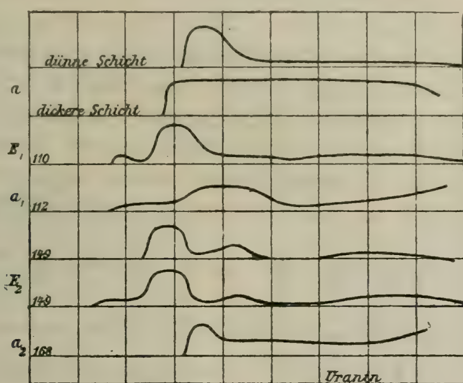
ally diminishes until *F*, becoming nothing at $F\frac{3}{4}G$. Beyond *G* it shows but little sensitiveness in the more refrangible part of the spectrum. The spectral absorption of this dye begins at *D*, but continues to be of small amount until slightly beyond *E*, when it begins to rise rather quickly and reaches a maximum at *F*, descending to a minimum at *G*, when it again rises.

When more dye is added, spectral sensitiveness and absorption, and especially the latter, are somewhat altered. With as much as 10 per cent. of the dye to the AgBr, the small yellow band remains the same, but the great green band at $D\frac{3}{4}E$ becomes steeper on both sides, and beyond $E\frac{1}{3}F$ there is but little sensitiveness in the more refrangible part of the spectrum. The absorption of this emulsion is practically the same with regard to its great maximum of absorption as that of the emulsion containing less dye; there appears, however, beyond *F* considerable increase of absorption until just before *G*, thence diminishing slightly but rising again as shown in the drawing. The displacement of the maximum of sensitizing action in relation to its own absorption in the case of this dye is very considerable.

Uranin.—Is easily soluble in water and gives an orange precipitate with $AgNO_3$ easily soluble. If a film of gelatine be not too intensely dyed, the absorption may begin at *E* rising at once steeply to a maximum at $E\frac{1}{2}F$, thence

descending and becoming almost nothing at $F\frac{1}{2}G$, still showing slight absorption to the end of the more refrangible part of the spectrum.

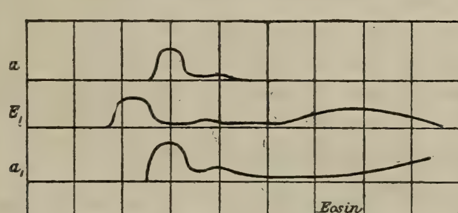
For sensitizing purposes I have used quantities varying from .1 to .3 gram of Uranin to every 2 grams of AgBr contained in the emulsion. Curve No. 110 represents the light sensitiveness in which the former amount was used. Its sensitizing action somewhat resembles that of fluorescein; it begins at $C\frac{2}{3}D$, reaches a very small maximum at just before D, thence to a small minimum at $D\frac{1}{4}E$, after which it rises to the broad maximum at $D\frac{2}{3}E$, remaining as such until past E, thence diminishing rapidly to F when it becomes almost nothing; beyond this it shows but faint blue violet sensitiveness.



The absorption begins at $C\frac{2}{3}D$, rising gradually until E, thence more rapidly to a maximum on both sides of F, again decreasing to a wide minimum at G after which it rises again.

With a larger amount of uranin, for instance .3 grams to every 2 grams AgBr present, spectral sensitiveness is somewhat altered—with a short exposure its light sensitiveness rises abruptly at $D\frac{1}{4}E$ to a broad intense maximum, decreasing again from E to a minimum, followed by a second maximum at F which quickly decreases to nothing between F and G, showing but slight sensitiveness beyond. With longer exposure, sensitiveness extends somewhat further on the less refrangible side—nearly as far as C. The maximum of absorption of this more strongly dyed emulsion is more pronounced and more nearly resembles that of the dye stuff in gelatine.

Eosin.—Tetrabromfluorescein. $C_{20}H_6Br_4O_5K_2 + 6.H_2O$. When a gelatine film is faintly stained with the dye, absorption is found to begin at about $D\frac{1}{2}E$ reaching a maximum at $D\frac{3}{4}E$—E. From E it rapidly falls to almost nothing, but shows, if gelatine be suitably stained, another slight maximum just before F.



For sensitizing purposes I used 5 per cent. to the AgBr present and with ammonia. With such an emulsion, spectral sensitiveness commences at $C\frac{2}{3}D$

rapidly rising to a maximum at D, which continues till $D\frac{1}{2}E$, then rapidly descending to almost nothing and rising again at $E\frac{1}{4}F$ to a small wide maximum as far as $E\frac{3}{4}F$, after which it again becomes almost nothing. Beyond, in the blue violet, sensitiveness is very weak.

The absorption spectrum of this dye very nearly resembles that of eosine in gelatine. It consists of two bands; the first and greatest reaches a maximum at $D\frac{2}{3}E$, the second just before F.

(*To be continued.*)

THE KAMARET.

MINOR improvements in photographic apparatus are constantly being made, but marked advances come few and far between. One of these latter is found in the new hand camera called the "The Kamaret," recently brought out by the Blair Camera Company. This little instrument is the most compact piece of mechanism in the way of photographic apparatus that we know of at the present time. When we say that it carries films or plates 4 x 5 inches, using the films on a roll and without a roll-holder, and that the outside dimensions of the box are $5\frac{1}{2}$ x $6\frac{1}{2}$ x $8\frac{1}{2}$ inches, it will readily be understood into how small a compass the inventor has compressed the working parts. And all this has been done without in the least impairing the working qualities of the instrument. The diagram given below, Fig. 1, shows the ingenious arrangement of the roll of film in the spaces hitherto not used in the construction of hand cameras, and the dotted lines exhibit the method usually adopted for the same purpose.

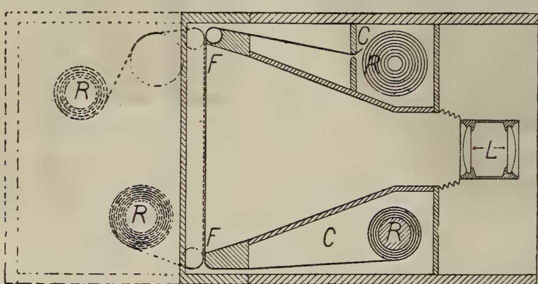


FIG. 1.

L—Lens. *F F*—Plane of focus or exposure. *R R R R*—Film Rolls. *C C*—Chambers for film.

The above improvement is a decided step in advance of anything yet accomplished in the economizing of space in the construction of hand cameras, but it is not all that can be considered new in the Kamaret. The shutter and its attachments are also admirable pieces of mechanical ingenuity. To make an exposure with this shutter it is only necessary to draw out a slender brass rod and then push it back again. By these movements several important results are attained. First, the pulling out of the rod sets the shutter and at the same time punches a hole in the film to show the exposure; secondly, the motion of the rod turns an index that registers the exposure on a revolving disk so that the user can tell at any moment just how many more film surfaces he has to spare.

The shutter is one of the go-and-return variety, made of very thin and stiff brass, and works to perfection. We have used this camera for a week and under a great variety of circumstances, and it has never failed to respond to our touch

at the right moment. This is something that we have not been able to say of every other camera that we have had submitted to our inspection.

As in other cameras using rolls of film, there is a key to turn off the exposed surface, but we do not know of as simple a device as is used in the Kamaret to insure the removal of the film that has been exposed, and at the same time to see that it has been accomplished. This very desirable result is attained by having in the side of the box a simple narrow shutter, opened by the pressing on a button, that exposes the merest edge of the film that carries the punch marks made in setting the shutter. When this narrow edge is exposed the observer can see the punch mark on the film, and from its position on the left or right can be assured that the film has or has not been exposed. This will save many a blank piece of film in the developing dish.

The appearance of the shutter, together with the two finders, the diaphragm and the focusing arrangement are well shown in the cut here given, Fig. 2.

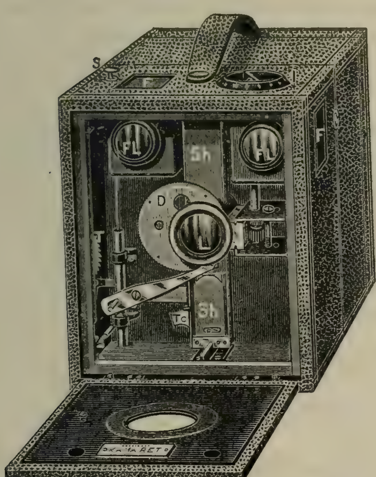


Fig. 2.

Fig. 3.

For those who like to use glass plates a neat and compact attachment is provided, as shown in Fig. 3. This has one of the simplest and best swing-back arrangements ever fitted to a hand camera.

We have had a good deal of pleasure in the examination of the Kamaret, and for excellence of working parts and finish it leaves nothing to be desired.

OUR ILLUSTRATION.

The "Studies in Composition," from the studio of Mr. George G. Rockwood, of New York, with which we illustrate this issue of the Bulletin, are worthy of observation as the results of the experience of one of the best and most enterprising of our professional artists. This work needs no commendation from us, it speaks for itself. In presenting it to our readers we hope it will encourage them to equal or excel in the same phase of photographic work, and we know of no one who will praise them more readily than George G. Rockwood.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

SPECIAL PRIZES FOR THE COMING BUFFALO CONVENTION.

THREE prizes, $100 each, for the three best collections of Portrait work made on Cramer plates.

One prize $100 for the best Landscape work made on Cramer plates.

One prize $100 for the best collection of work, illustrating the rapidity of Cramer plates.

One prize $100 for the best collection of work on Cramer's new Isochromatic plates, showing their advantages over ordinary plates. Each picture to be represented in duplicate, one on an isochromatic and one on an ordinary plate.

All competing exhibits to be framed about 25 x 60 inches, with or without glass, with the photographer's name inscribed or attached thereon. Size and number of pictures in frame unlimited.

The Awarding Committee to be elected by the competitors themselves.

The competing pictures shall be placed in our exhibit and must be shipped in time, charges prepaid, to G. Cramer Dry Plate Works, care of Buffalo Convention.

The Air Brush Manufacturing Company have offered for prizes this year, on the work to be exhibited at Buffalo, one air brush for the best portrait in colors, and one for the best portrait in black and white, to be made with the air brush, over print or sketch. Competition open to all.

NEW RULE FOR MERCHANTS' DEPARTMENT.

Rule 8 governing Merchants' Department, Buffalo Convention, will be changed to read as follows: The art and stock departments will be opened each day at eleven o'clock A.M.

This change also necessitates calling the business meeting to order at 9 A.M. and it will be done if there be a quorum present.

This change has been decided upon because there has been so much trouble in getting the members and dealers to stop their trading and sight-seeing in order to commence the business meeting at ten o'clock, as previously required.

GEORGE H. HASTINGS,
Prest. P. A. of A.

A NEW cover, of artistic design, was recently given to Anthony's Photographic BULLETIN, and, under the able management of Professors Chandler and Elliott, this admirable magazine is kept up to the high standard which has made it known and valued wherever there are photographs and photographers. Dr. H. W. Vogel's letters from Germany are one of its special features, and the BULLETIN keeps its readers thoroughly posted as to every advance which is made in the art and science of photography.—*Philadelphia Ledger*.

ANTHONY'S PHOTOGRAPHIC BULLETIN appears with a new and greatly improved cover design. This thoroughly modern journal fills an important place with much success.—*Brooklyn Times.*

I HAVE read it (the BULLETIN) with pleasure, and lent it to many, many friends. ADELAIDE SKEEL.

ANTHONY'S
Photographic Bulletin.
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Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.
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THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held on Wednesday evening, May 13, 1891, the *President*, Mr. JOHN G. BULLOCK, in the chair.

The Board of Directors presented their monthly report, in which the standing committees for the ensuing year were announced. They also reported the purchase of a fine pair of dissolving optical lanterns, including five pairs of lenses of various focal lengths, suitable for rooms or halls of any size. Important additions to the library were announced, also the election of the following active members: Robert Eastburn Fox, William Stewart Harding, and Thomas Jonathan Keltner.

The President announced the appointment of the following gentlemen as a special committee to take into consideration the feasibility of starting a movement looking to a uniform method of marking the sensitiveness of dry plates: Messrs. Charles R. Pancoast, Coleman Sellers, Frederick Gutekunst, Thomas H. McCollin, and Wm. H. Rau.

Mr. John Carbutt exhibited a Watkins exposure meter which he brought for examination, as promised at the last meeting. He had tested the meter that morning, and it seemed to agree with the one he had previously used, which had been brought over by a gentleman living in the West, who desired him to rate his plates to work with it, if possible. The maker of the instrument had attempted to give some scale by which American plates could be used, but as far as it related to his (Mr. Carbutt's) plates, it was very far from being correct. Various negatives were shown to the members by Mr. Carbutt, illustrating his trial of the instrument, the conditions under which they were exposed being fully described. His opinion was that the meter was practically correct, provided the sensitiveness of the plates used was known, and this would have to be ascertained by the operator, as there was no correct guide given. A man would have to use judgment in its use.

The chairman inquired if one would not have to use as much judgment in its use as was required in exposure by the ordinary method?

Mr. Carbutt said that the instrument did what was claimed for it. It saved the wasting of plates. In regard to the pendulum attachment, for his part he would prefer not to use it, because with our strong sunlight it would puzzle a great many to watch both the pendulum and the sensitive paper at the same time. The instrument had this value, that it would enable them to estimate the quality of the light better than the eye could, especially at this season, when the light is so changeable.

Mr. Hand said he had examined one of these instruments, and found that the indexing was wretchedly done. It was not in anywise accurate.

Mr. Carbutt said that in using this instrument, and in correspondence with the agent he found they did not agree. Where the instrument he was using said such and such was the reading, he (the agent) said it could not be; hence their instruments were evidently different.

Mr. Cheyney said there was an article in the current number of Anthony's BULLETIN on the subject of exposure meters, which seemed to him more rational than any of them. The inventor of the meter referred to, coats the bottom of a brass tube with luminous paint, which he exposes to the light the picture is to be taken with. Then a cap is placed on the tube, and through a small peep-hole the time it takes the luminous paint to fade is noted. This luminous paint is affected entirely by the blue rays, and a very close approximation can be made as to the proper exposure to be made.

The chairman said he did not think it could be depended upon. The same batch of paint might be constant, but no two batches would be alike.

Mr. Ives remarked that the time in which this paint lost its luminosity depended upon the temperature. If it was warm it lost it quicker; if cold, it held it for a long time.

Mr. Stirling thought in that case one would require a series of comparative tables. When the thermometer was 32 degrees, so much; when 70 degrees, so much. Mr. Taylor suggested that it was something like Captain Cuttle's watch.

Mr. C. E. Hopkins, was present for the purpose of exhibiting to the members specimens of Omega sensitized paper, and demonstrating the toning of prints made on that paper. Before doing so he exhibited a new shutter, called the "Pneumo." The shutter, which was of the rotary type, could be placed either outside or inside the lens, and instantaneous or time exposures could be made at will. He claimed there was nothing liable to break or get out of order, and it was sold for a very low price.

Prints made on the Omega sensitized paper were next shown and toned by Mr. Hopkins. The paper is coated with a gelatine emulsion, and printed in sunlight, requiring about one-third less time than ordinary albumenized paper. A combined toning and fixing solution is sold for use with the paper, or a formula for preparing the same is furnished with each package. Unlike most ready-sensitized albumen papers, a satisfactory black tone can easily be obtained when desired, or by stopping the toning at an earlier point warmer tones are obtained. The print should be made considerably darker than the finished tone desired, and immersed in the toning solution without first washing, being left therein until the desired tone is obtained, and then well washed in several changes of water. They may be mounted directly after washing, or can be hung up to dry or laid face up on blotting paper, care being taken not to place anything on top of the prints till thoroughly dry, as it would adhere to the gelatine surface. The prints can be glacéd by squeegeeing them face down on a tin-type plate. It was claimed that the paper was more permanent than albumen paper, and would not fade if properly used.

Mr. Bell took exception to the toning and fixing in one solution; the prints so treated were going to fade. In the olden time they were taught to tone separately and fix separately, if they desired to get permanent prints, and the mixture of the gold and hypo together looked as if they were going back to the old fading time.

Mr. Hopkins said he had not found this to be the case. The prints in the sample book shown them had been made for over a year, and they were just as good now as when they were first made. Adjourned.

ROBERT S. REDFIELD,
Secretary.

PACIFIC COAST AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE Pacific Coast Amateur Photographic Association, of San Francisco, has just concluded its annual exhibition of lantern slides and prints, and is congratulating itself upon one of the most successful displays it has ever made. This Association, which is the oldest on the Pacific Coast and one of the oldest in the United States, has just moved into commodious quarters in the Flood Building, and was thus enabled for the first time in its history to hold its annual exhibition in its own rooms, which are now most admirably adapted for the purpose. While the number of prints shown was smaller than in former years, the improved quality of the work more than compensated for the decrease in number, and the crowds who visited the rooms seemed to appreciate all they saw. The most noticeable features of the exhibition were the scarcity of albumen prints and enlargements and the prominent part taken by the lady members, who showed that they could produce work of a quality equal in every respect to the best on the walls.

Among the different exhibits, the President, Major W. H. Heuer, showed some extraordinary results which he called "Freaks," and which certainly were, as they were intended to be, a puzzle to most people as to their method of production. Besides these and some humorous studies, which were much noticed, he also showed an exquisite portrait of a child, that was universally admired.

Miss C. A. Burke had the largest exhibit of any member. Her prints were mostly genre studies of children and deserved great credit for the enormous amount of patience and ingenuity which she must have displayed to have obtained such results. Her "Rivals," "School," "Beginning Early," and "A Brown Study," may be particularly mentioned. Another more ambitious attempt, by the same lady, was "A Last Look," which

represented two figures standing on the sea shore, straining their eyes to obtain a last look at a ship rapidly fading into the distant mist.

Miss I. W. Palache showed a large number of studies, mostly landscapes, which all showed the result of true artistic feeling, combined with a perfect technical knowledge of Photography. Her "After the Storm," and "Angora Creek," were the most complete as pictures, but an artist lingered long over "Approaching Storm at Tahoe," and "Early Morning at Tahoe," which fascinated by their true rendering of nature as it really is.

Mr. P. S. Carlton showed a large number of landscapes and marines, mostly printed in platinum, a few in bromide. The most pleasing, perhaps, was "San Lorenzo Creek," a bromide enlargement of very fine quality, but all were good, and the number was too large to admit of detailed mention.

Mrs. J. P. Le Count had several genre pictures which showed great feeling and artistic touch in their arrangement. While "Songs Without Words," and "Seaweeds," were both great favorites, her most popular picture was "Anxious Hearts," which attracted much attention and was universally admired. It represented a mother and her child looking anxiously from beneath the stone arches of a castle on to the lengthening shadows for some hoped-for figure which is long delayed.

Mr. E. L. Woods was, as usual, represented by a choice collection of landscapes which showed great taste and skill in their selection and production. One of the oldest and one of the best workers in the Association, he this year was stronger than ever and his exhibit was universally admired. While there was not one study in his whole collection which was inferior, the most attractive were "After the Rain," "Evening Near Blythedale," and "Worn Out."

Mr. Palache showed some excellent work, mostly landscapes from the mountain region of California, of which "Mount Tellac," and "The Lonely Lane," deserve especial mention.

Mr. C. F. Cormack had some exquisite studies, printed on bristol card board, of which "A Dark Room Assistant" and "Portrait of a Child" were the most noticed.

Mr. G. Knight White, the Secretary, exhibited several specimens of carbon printing of which "Tired" was the most attractive. It represented a young girl, worn out with her labor, leaning over her spinning wheel and dreaming of other days. This print was awarded the prize given to the most popular picture in the exhibition, as decided by a ballot of the visitors and members.

Dr. H. P. Carlton had a fine collection of landscapes and marines, mostly printed in platinum, of which "In Winter Quarters," "Through the Pines" and "On San Lorenzo Creek" were especially good.

Mr. G. W. Dornin's "Blue Monday," "Winter Foliage" and other studies, attracted much attention, but his "Early Morning in Sonoma Valley" was probably the most perfect landscape in the exhibition. The fog banks lying in the valleys while the rising sun lit up the hill tops was perfectly rendered.

Miss Hitchcock had several well executed bromides, of which her "Study of a Cat" attracted most attention. Her "Curiosity" was also particularly good.

Dr. Goddard's "Sambo" and "Critics from the South" were both good, although the latter strongly resembled Mr. Lowden's "Critics," exhibited in 1888. His "Gathering Daisies" was also very popular.

Mr. Herrick had several landscapes which showed good selection, particularly his "South Dome of the Yosemite."

Mrs. January exhibited a portrait of a child, which showed great taste and feeling. Mrs. Burt had a study of an old oak tree, which was very picturesque and attractive, and Miss E. W. Ward had a series of views of "Malabar Glen," which were very creditable. These ladies have very recently joined the Association, but are evidently capable of taking their place with any of the older members. It is to be hoped that more of their work will be shown another time.

Mr. I. E. Thayer showed a number of prints from good negatives, but many of them were spoiled by being produced in a process which gave them the appearance of inferior pink tin-types. Those which were printed in bromide or silver were highly creditable.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

The last meeting for this session of the above section was held on Tuesday, June 2d, at the rooms of the American Institute, 113 West 38th street. Mr. Henry J. Newton occupied the chair and quite a number of distinguished veteran photographers were present. The meeting was a very interesting one, its object being to compare lantern slides made

by the wet plate and albumen processes with those made on the modern dry plate.

The Secretary acknowledged the receipt of several publications and announced that the dinner committee had met and thought that a trip up the Hudson as far as West Point or Newburgh would be acceptable for the annual excursion, the date proposed being about September 10th.

Mr. Van Brunt, who had been appointed to represent the section at the Amateur Photographers' Conference, presented a report. He said that as far as it had gone it was a complete success. The meetings had not been overcrowded, but there had always been a sufficient attendance to keep the lecturer in countenance. He thought it had come to stay and that it would be the leading amateur photographic society of this country. The report was accepted and adopted.

The next business dealt with the primary object of the meeting, the comparison of lantern slides. The first shown was a series by Mr. A. D. Fisk, some being upon wet plates and toned in various ways, and others upon dry plates. The slides were freely criticised by many present and at the close of this batch, opinions were very different. One view, the side of a street in spring time was very good, but the snow-like effect, where the sun caught the ground was much commented upon. Another slide of this subject which had been toned with gold was conceded to be much better. Some views near Lake Champlain were of particular excellence. A series of slides upon dry plates was next thrown on the screen and here the snowy effect was very much more apparent, the general verdict being "Too much snow."

The next exhibitor was Dr. Laudy of the School of Mines, Columbia College. He represented the scientific element. The first slide was of a complete daguerrotype outfit and a farewell tribute was paid to it. Next followed a magnificent collection of photomicrographic slides, two of each subject being shown, one on a wet plate and the other on a dry plate. Dr. Laudy challenged the audience to discriminate between the two, and frequent attempts to do so resulted in failure. The Mosquito, Flea, Tongue of Fly, Sting of Honey Bee, and a host of others were shown, in all cases the detail being equally preserved in both the wet and the dry plate. The last of Dr. Laudy's slides was one showing a complete wet plate equipment and this too he bade farewell to, trusting never again to use a nitrate of silver bath.

Mr. Van Brunt's slides were all upon dry plates and included views in Central Park and around New York. Some of these were a little too dense, but the series was one of particular excellence and was a strong argument in favor of the dry plate.

The next exhibitor was the old veteran photographer, Mr. T. C. Roche. Mr. Roche's capabilities are well known, as is also his love of the wet plate process. In his hands this latter process was sure to receive the best possible attention and the superb series of slides shown by him called forth repeated applause. The series included slides made by the old wet collodion, collodion emulsion and collodion albumen processes, and left nothing to be desired. Taking the slides as shown it would be hard to give any other process the preference, for in every slide shown by Mr. Roche perfection was seen, where snow and dense shadows were visible in the dry plates by others present.

Mr. Newton did not suppose that any one who knew anything about lantern slides would dispute that good slides could be made on wet plates, but the question was whether as good work could not be done by more certain and simple processes. He thought that where brilliancy was in the wet plate, atmospheric effect dominated in the dry plate. Mr. Newton's slides demonstrated what he wished to convey, namely, that aerial perspective is as important as linear perspective. He did not advocate the sole use of plates made exclusively for lantern slide work, but had found that with a hard negative better results could be obtained upon a quick ordinary plate. Many of his slides, he stated, were toned with iodide of mercury, the plates being immersed in a solution of mercuric iodide in potasium iodide, then washed and fixed in hypo. Considerable discussion ensued as to the intensifying capacities of this method, and more is likely to be heard of the question.

A most interesting meeting terminated at 10.30, the section adjourning until the first Tuesday in September.

AMERICAN PHOTOGRAPHIC CONFERENCE.

THE American Photographic Conference convened for its annual meeting at the rooms of the Society of Amateur Photographers of New York on Tuesday, May 26th, at 10 A.M. The Council met at 9 A.M. and received the report of the "Local Committee" relative to the arrangements made for the Excursion

Dinner, etc. The Council by a unanimous vote sustained the report of Secretary in regard to the contract which he had entered into with the publishers of the *Photo-American Review*. It was formally voted to make the *Review* the official organ of the Conference.

On the call of the roll the following delegates responded: Postal Photographic Club—Randall Spaulding, Miss C. V. Clarkson, Miss Frances B. Johnston; Syracuse Camera Club—Dr. Ely Van de Warker, George Timmins, Dr. Clifford Mercer, Frederick Frazer, J. R. Clancy; Hoboken Camera Club — A. J. Thomas, Alex. Beckers; Cincinnati Camera Club—George Bullock; Society of Amateur Photographers of New York—T. J. Burton, F. C. Beach, Dexter H. Walker, H. N. Tieman, James H. Stebbins, Jr.; Photographic Society of Waterbury—C. R. Pancoast, E. E. Dewitt, Frank Welton; Brooklyn Academy of Photography—H. S. Fowler, Dr. John Merritt, George S. Wheeler; Newark Camera Club—W. A. Halsey, Paul Thiery, Dr. T. Harvey, Guy J. Edwords; Chicago Camera Club and the Photographic Society of Chicago —C. Gentile; Camera Club of Hartford—Charles N. Nason, Samuel W. Blanchard, H. McManus; Brooklyn Society of Amateur Photographers—H. Ladd, H. P. Sewall; Lynn Camera Club—W. H. Drew; Yonkers Photographic Club—J. W. Alexander, Edward T. Sherman, Otto C. Beers; Peekskill Camera Club—Dr. P. H. Mason; Boston Camera Club, Lowell Camera Club—W. H. Drew; Washington Camera Club—Max Hansman; (Photo Section) American Institute—C. Van Brunt; Agassiz Association—W. T. Demarest; Plainfield Camera Club—Oscar S. Teale, Dr. J. Francis Chapman.

The Conference met at 10.30 A.M., President Van de Warker in the chair. Dr. Van de Warker delivered a very interesting address reviewing the progress of photography during the past year, and forecasting a bright future for the Conference.

The Secretary presented his report, which speaks well for the rapid growth of photography, and the increasing interest in the national organization. The Secretary stated that at the organization of the Conference in December last, eighteen organizations were represented by delegates. Since then seventeen clubs had applied for admission and were elected to membership, the total membership now numbering thirty-five. Secretary presented the report of the Council which was on motion approved by tbe Conference.

The Treasurer of the Conference, Mr. William H. Drew (President of Lynn Camera Club) presented his report showing a balance of $400 in the treasury. The report was accepted. The next order of business was the election of officers, and members of the Council. Dr. John L. Merritt moved that the present officers be re-elected, which was unanimously adopted. The officers for the ensuing year will be: President, Dr. Ely Van de Warker, Syracuse Camera Club; 1st Vice-President, George Bullock, Cincinnati Camera Club; 2d Vice-President, Dr. George L. Parmele, Hartford Camera Club; Secretary, T. J. Burton, The Society of Amateur Photographers of New York; Treasurer, W. H. Drew, Boston Camera Club.

A retiring committee, consisting of Messrs. Frazer, Nason and Beckers, was appointed to nominate the members of the Council. They reported the following names, which were adopted: Miss Frances B. Johnston, Washington Camera Club; Oscar S. Teale, President Plainfield Camera Club: Prof. Randall Spaulding, President Postal Photograph Club; William A. Halsey, Newark Camera Club; Harry S. Fowler, Brooklyn Institute of Photography; John V. L. Pruyn, Albany Camera Club; C. R. Pancoast, President Photographic Society of Waterbury; Cornelius Van Brunt, (Photographic Section) American Institute; A. J. Thomas, President Hoboken Camera Club; J. W. Alexander, President Yonkers Camera Club.

A letter was read by the Secretary from the Cincinnati Camera Club, inviting the Conference to hold its next annual meeting in Chicago. The letter was referred to Council to report on Thursday morning.

Mr. C. R. Pancoast, President of the Photographic Society of Waterbury, read a well written paper, entitled "The Requirements of the Modern Photographic Society." An interesting discussion followed, which was participated in by a dozen members. A hearty vote of thanks was tendered to Mr. Pancoast.

Mr. Guy J. Edwords, of the Newark Camera Club, opened up an interesting discussion in regard to a "Conference Lantern Slide Interchange," and moved that a committee of three be appointed to formulate a set of rules to govern the interchange, and to report at the afternoon session. Carried. Chair appointed Messrs. Demarest, Edwords and Bullock.

Conference adjourned until 2 P.M.

Afternoon Session.

The first order of business was the report of the Committee on Lantern Slide Interchange. The Committee presented the following report:

The Committee appointed to report on a plan for a lantern slide interchange beg leave to submit the following report: We recommend the following provisions:

1. That a lantern slide interchange be formed among the clubs composing the American Photographic Conference, to be known as the "Conference Lantern Slide Interchange."

2. That the clubs represented in the Conference be divided into circuits according to their geographical location. The clubs forming each circuit to interchange slides among themselves, after which, each circuit to exchange with other circuits.

3. That at each annual meeting of the Conference a lantern slide exhibition be given of slides selected from the exhibit of each club in the interchange.

4. That each club select its own slides through a committee elected for that purpose.

5. That no slides be allowed in the interchange which are not the unassisted work of members submitting the same.

6. That the interchange shall be under the management of the Council, who shall be empowered to appoint a committee to arrange all details of the proposed interchange and formulate rules and regulations, and send a printed circular to each club in the Conference, requesting them to take action in the matter.

(Signed) W. T. Demarest,
George Bullock,
Guy J. Edwords,
Committee.

The report of the Committee was received and adopted.

Dr. A. Clifford Mercer delivered a very interesting paper on "Photomicrography," and exhibited about one hundred lantern slides upon the screen. After a hearty vote of thanks to Dr. Mercer the Conference adjourned for the day.

Evening Session.

Mr. Wallace Gould Levison delivered a very interesting lecture before the Conference at the Fifth Avenue Art Galleries, entitled "Instantaneous Photography as an Aid to Science, Art and History." The lecture was listened to by an audience of about five hundred, who also viewed the collection of pictures exhibited by the Joint Exhibition.

Council Meeting, May 27th, 9 a.m.

The Council met at 9 a.m., and took up the question of place of the next annual meeting. The invitation from Cincinnati was read, and after considerable discussion, during which Washington, Saratoga and New York were suggested, it was finally decided to recommend to the Conference that it should be held in New York in the latter part of May, 1892. It was also decided to have an exhibition of prints and apparatus at that time, the chair to appoint a special committee to arrange the same. The chair was given power to appoint a committee on Papers and Conference Standards, this committee to report to the Council, the object of this committee being to secure papers and to arrange "Conference Standards" of lantern slides, weights and measures, etc. A committee was also authorized to be known as "Committee on Foreign Relations, Custom House Photographic Privileges and Badges," This committee will appoint a sub-member in each large center to secure special privileges in photographic objects of interest. The committee will issue a card containing the list when completed to Conference members. Council adjourned to 9 a.m. Thursday.

Conference, 10 a.m., May 27th.

Vice-President Bullock presided.

Dr. Ely Van de Warker read a very interesting paper entitled "Photography in the Marine Tropics." This paper was discussed by a large number of delegates.

Dr. A. Clifford Mercer read a paper entitled "Comparative Notes on Fourteen Kinds of Lantern Plates," calling especial attention to the Alpha plate (illustrated by sixty slides).

After a discussion of the above paper Mr. Alexander Beckers exhibited a very unique camera of his own invention.

At 12 m. the Conference adjourned in order to accept the joint invitation of the Brooklyn Academy of Photography and the Society of Amateur Photographers of New York to attend an excursion around the harbor.

Excursion.

About four hundred amateur photographers and friends attended the excursion. The *Laura M. Starin* steamed up the Hudson as far as Riverside Park, and then ran down past the Statue of Liberty as far as the forts in the Narrows. The return trip was made up the

East River, under the Brooklyn Bridge, around Blackwell's Island, landing the New York contingent at 32d street. Cameras of all kinds and descriptions were carried by the delegates, and snaps were made at the Spanish man-of-war, the Statue, Forts Wadsworth, Lafayette and Hamilton, the jaunty yachts at anchor at Bay Ridge, Governor's Island, Brooklyn Bridge, and lines of prisoners marching "lockstep" on Blackwell's Island. Many a sly shot was made by delegates at their colleagues, of which they will know nothing perhaps until they see them upon the screen. The trip was a grand success, and was greatly enjoyed by the delegates. The landing was made in ample time for the evening's exhibition.

WEDNESDAY EVENING, May 27, 1891.

Special exhibition tendered to the delegates by the Brooklyn Academy of Photography.

A COMPLIMENTARY EXHIBITION.

The Brooklyn Academy of Photography Entertain.

The Criterion Theatre was packed from pit to dome with friends and guests of the Brooklyn Acadamy of Photography, on the occasion of the exhibition of lantern slides tendered to the delegates attending the first annual meeting of the American Photographic Conference in New York. All the exhibits were specimens of the work of local artists, and as such, show, in many cases, amateur photography in its most highly developed aspects. Dr. Ely Van de Warker, George Bullock, W. H. Drew and T. J. Burton, the officers of the national association, were present and occupied the box on the left side. Of delegates present, there was a large number. The hall was devoid of decorations, except that wrapped about the pillar of the officers' box were folds of bunting bearing the legend, "The American Photographic Conference."

The exercises were opened by an address of welcome by Mr. Gonzalo Poey, the Vice-President of the entertaining society. He greeted the visitors heartily and assured them that it was a rare pleasure indeed to be permitted to carry out such an exhibition as proposed, especially before such a sympathetic audience of fellow photographic artists. He referred to the history of the Brooklyn Academy, which began four years ago with but twelve members, and now nearly one hundred representatives of various professions and business pursuits held connection with the organization. The work of the society was briefly sketched and special note was made of its most remarkable achievements. In closing, he said that he would submit for inspection a small plate which shows the most extraordinary step yet taken in photographic reproduction of color, the invention of Professor G. Lippmann, of the Faculty of the Academy of Paris, and a member of the Academy of Sciences of France. The negative displays an almost perfect image of the solar spectrum, and all the colors and shades are accurately reproduced. The plate is the first one brought to this country, and was procured by Frank La Manna, the Brooklyn Academy's President, who is a personal friend of Professor Lippman, and is now sojourning in Paris. The process of doing such photographic work was then minutely described in order that the amateurs might prosecute experiments of their own. The glass plate was then passed to the conference officials to be viewed, and a generous invitation was extended to the audience to come forward and look at this latest triumph of photography at the close of the evening's programme.

(*To be continued.*)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—H. V. W. writes: What book shall I get that will give me the chemistry of photography that does not go too deep into the subject, and that will be intelligible to one who has not gone deep into chemistry himself? I need the general science of the art.

A.—Modern photographic chemistry is by no means simple, but for a beginner we know of no better works than Hardwich's "Photographic Chemistry," and Meldola's "Chemistry of Photography." Both of these works are obtainable from our publishers.

Q.—J. C. A. Jr., writes: Please tell me how to burnish prints mounted on cloth-back mounts? See enclosed piece. Some of my prints wrinkle in burnishing and are thus spoilt.

A.—Allow the prints to become very dry after mounting, and then burnish. If too dry, a moment in the steam of a tea kettle with albumen face in steam will overcome the difficulty. Don't steam the back of the mount.

Q.—H. R., writes: I would like to know how to make emulsions for bromide paper, or how to coat bromide paper for enlargements, or please refer me to some book if any are published on the subject?

A.—The best work on this subject is Dr. Elder's "Modern Dry Plates" to be obtained from our publishers. Also for coating paper, Abney's "Instruction in Photography."

Q.—A. C., writes: Would like to have you publish in BULLETIN formula for acid sul-

phite fixing bath, one that you know from practical experience to be a good and reliable one?

A.—Use a hypo bath, one of hypo in four of water and add to every quart of it about 2 ounces of acid sulphite solution.

Q.—G. J. W. writes: Kindly inform me of any works published on the making of albumen paper, and whether kept in stock by the publishers of the BULLETIN?

A.—Carey Lea's "Manual of Photography," page 270, contains much practical information; and Robinson & Abney's "Art and Practice of Silver Printing" has an entire chapter (Chapter II) devoted to the same topic. In both good practical directions are given, and the books can be obtained of our publishers or through any good book store.

Views Caught with the Drop Shutter.

THE new gallery which Mr. W. G. ENTREKIN has just opened in Philadelphia is one of the handsomest in the country. The building in which it is located was formerly a public hall and could not be better adapted for the purpose of a photographic gallery if it had been built for it. Three divisions have been made in this hall; to the right, as you reach the top of the stairs, is the framing room, and beyond it the private office. Turning to the left you enter a spacious apartment, which is the reception room, very handsomely furnished and decorated, everything being in perfect harmony and producing a quiet, restful feeling while sitting in the room, which perhaps is one of the reasons why pictures made here are so satisfactory. In the third division are the dressing rooms, of which there are three, and the dark room, while just above them is the operating room, fitted with every modern appliance for the successful conduct of a photographic gallery. We have no doubt that Mr. Entrekin will meet with great success in his new location, for, in addition to his pleasant surroundings, is the fact of his long experience and the high reputation which he has long held in the photographic world.

ZIMMERMAN BROS., of St. Paul, have removed from Sibley street to 375 Minnesota street. Their removal marks the twentieth anniversary of their business career in St. Paul. They occupy the basement and two floors in their new spacious quarters, which renders it more convenient than their former location.

JOHN CARBUTT, the veteran dry plate maker, claims exclusive right to use the trademark letters A and B, as applied to various grades of photographic dry plates, and proposes to take proceedings against any one using the same for the same purpose.

WE regret to hear from Mr. F. H. LEE, of Ansonia, Conn., that he lost his studio by fire on May 15th. He writes us that he lost 16,000 negatives, a large number of backgrounds, accessories and cameras, together with thirteen fine lenses of Dallmeyer's and other makers. With true Yankee pluck, he concludes, "It was a hard blow, but we are refitting, and though I had a nice gallery, I shall have a better one." We heartily wish him every success.

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ON GUARD.

MADE WITH ANTHONY'S 2 B EQUIPMENT.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. JUNE 27, 1891. No. 12.

THE FOURTH JOINT EXHIBITION.

THE united exhibition of the Boston Camera Club, the Society of Amateur Photographers of New York, and the Photographic Society of Philadelphia, took place in the Fifth Avenue Art Galleries in New York, from May 25th to June 13th. It was originally intended that the exhibition should close on June 6th, but it was found to be so popular with the visitors, the time was extended to the later date.

In all there were five hundred and thirty-six exhibits, and they showed the work of the various societies as follows: The Society of Amateur Photographers of New York had one hundred and eighty-four frames from thirty-nine members; the Photographic Society of Philadelphia, had one hundred and six frames from sixteen members; the Boston Camera Club had fifty-three frames from eleven members; the Lowell Camera Club eleven from three members; Washington Camera Club, thirteen from two members; Syracuse Camera Club one; New York Camera Club, twenty from three members; Yonkers Camera Club one; Agassiz Association, twelve from two members; while the foreign exhibits numbered eighty-nine, and the miscellaneous forty-six.

Twenty medals were awarded as prizes, eight of which went to the following English exhibitors: H. P. Robinson, for composite views; J. P. Gibson, for landscapes; Frank M. Sutcliffe, for English harvest scenes; Adam Diston, for genre studies; F. P. Cembrano, for twilight and dawn studies; C. Court Cole, for cathedral pictures; Martin J. Harding, for Welsh scenes, and Richard Keene, for views in Derbyshire. The rest of the medals went to the following American exhibitors: W. H. Jackson, of Denver, Col., for his large and handsome views of the Hudson River and Mexico; Charles I. Berg and Alfred Steiglitz, of the Society of Amateur Photographers of New York; Robert S. Redfield and Alfred Clements, of the Photographic Society of Philadelphia; James L. Breese, of the New York Camera Club; George A. Nelson, of the Lowell Camera Club; E. H. Lincoln and John H. Tarbell, who are not credited to

any society. The medals for lantern slides went to Miss Catherine Weed Barnes, of Albany, N. Y.; Charles Mitchell, of Philadelphia, and George H. Wilson, of Scotland.

The exhibition was the best that the united societies have ever had, both in the matter of work exhibited and in the character of the exhibition hall selected for the purpose. We must also congratulate the Committee of Arrangements on the excellence of the hanging of the exhibits so that the pictures could be easily seen by all observers.

The prize pictures were all of the finest character, so we shall pass them over with the intention of picking out some of the more notable of those that did not seem to fulfill all the requirements of the judges to receive medals.

C. H. Miller, of Philadelphia, had a most beautiful bit of scenery in his picture "The Village Mill," showing great skill in the use of orthochromatic plates and in the printing on bromide paper. His "Old Highway" was also very fine. The portrait studies of Clarence B. Moore, also of Philadelphia, were among the best of these in the exhibition, and the pictures "There He Goes" and "Out of Sight" were little gems of artistic composition of the best character. The two flash-light pictures of Phyllocactus Latifrons by Edward T. Bradway, were remarkable pieces of photographic work of the most difficult order, showing to perfection the wonderful beauty of these interesting flowering plants. The same worker also exhibited a view "On the Delaware," which, in the beauty of light effects reminded us of Turner. C. R. Pancoast had an exhibit of unusual merit, and his picture "A Letter from My Boy" was a gem of genre study. The platinotypes of Alfred Clements were very pretty, and some of them were beautiful, notably the one entitled "Spring," where the effects of reflection in the stream were uncommonly fine. Dr. Charles Mitchell, of Philadelphia, had a number of European views of the finest character. His "Early Morning at Chamouni," "A Swiss Valley," "A Storm on the Matterhorn," were some of the best effects in snow and clouds that were in the exhibition. H. C. Dunham, of Boston, had some fine pictures of flowers, the roses being particularly good. The same exhibitor had also a number of little instantaneous shots that were gems of this kind of work, and much ahead of the general run of snap pictures. Louis Meldon, of Dublin, had some of the best instantaneous work in the exhibition. Shots at lawn tennis players, high jumpers and divers, which showed the finest details in the features of the men, and at the same time their positions in the contests, were the most remarkable pictures of the kind ever seen at any exhibition. J. H. Harvey, of Melbourne, Australia, had a fine exhibit of the Parliament Houses at Victoria that were interesting as well as finely executed. For work in panoramic views the pictures of Dr. P. H. Mason, of Peekskill, N. Y., printed from two 5 x 7 negatives were gems, and among the best views of Hudson River scenery that we know of. For the artistic work and fine selection of points of view that give the best pictures the exhibit of H. M. Grisdale was in our minds among the most interesting series of photographs shown. The Bronx Park views were full of beauty, and two others "Study of Foliage" and "Water Fall, Adams Brook, Pa.," were gems of picturesque scenery. Charles H. Davis, of New York, had some of the best genre studies in the exhibition. It is difficult to say in what particular these pictures excelled, but they appealed so strongly to the sympathies of the observer that the frames containing them were constantly surrounded with interested eyes noting

the points brought out by the artist. They were truly genre pictures of the highest order, and the exhibitor had the good fortune to obtain the services of models that helped to give the best effects to his ideas. Albert S. Guild, of Lowell, Mass., had some gems of woodland and river scenery that were worthy of careful inspection. The studies of blossoms by W. M. Renwick, of New York City, were very beautiful, and his portraits with the use of natural backgrounds were exceedingly fine, notably those where white dresses were worn against a foliage of ferns.

We are sorry that we cannot have space to note more of the fine pictures to be found in this most interesting exhibition, but what we have said only coveis the more notable pictures. We must congratulate some of the exhibitors on their progress over former efforts, and we hope that in future contests, a better classification of the exhibits will ensure a better distribution of the awards than was possible in the case of this exhibition, where no such arrangement was attempted. There is no doubt that photographs must be arranged in classes according to the kind of work they represent, in order to give a fair chance to all kinds of exhibitors. But even with these drawbacks the fourth annual exhibition was the best of those yet given by the united societies.

EDITORIAL NOTES.

We understand that a rare treat is in store for such as attend the coming convention at Buffalo, inasmuch as a large collection of new work from the hands of Mr. H. P. Robinson, of Tunbridge Wells, England, is now being mounted and put in shape for exhibition, which, to all who are at all conversant with the work of this artist, is sufficient indication of the pleasure to be derived from its study.

In the Vienna International Photographic Exhibition, the following American exhibitors have had their pictures accepted: H. McMichael, of Buffalo; John Dumont, of Rochester; George A. Nelson, of Lowell; Alfred Steiglitz, and J. L. Breese, of New York; Mrs. Grey Bartlett, of Chicago; John G. Bullock and G. B Wood, of Philadelphia; Miss Mary Martin and Henry B. Reid. Out of six hundred exhibits offered four hundred and seventy were rejected.

There is every evidence that the Buffalo meeting of the Photographers' Association of America will be a grand success. Those of our readers who have not yet arranged to go should do so at once, and if possible send an exhibit for one of the prizes or be prepared to enter into or lead some discussion upon topics of interest to the fraternity.

The recent joint exhibition of the work of the combined clubs of Boston, Philadelphia and New York was so successful and meritorious that it was continued a full week beyond the time originally set for its close and was much enjoyed by the many who availed themselves of the increased time.

The Newark Camera Club has just given a most enjoyable exhibition of work by its members in the way of a lantern slide evening, the result being indicative of hard work and artistic feeling throughout.

We note with regret that Mr. C. R. Pancoast, who has so ably conducted the photographic department of the *Connecticut Guardsman*, has been obliged, owing to change of business and consequent removal, to sever his connection with that paper. We can only express the hope that some one equally well fitted to succeed him may be found, and that some other photographic journal in the neighborhood of where he is to be settled, may be so fortunate as to secure his services. We certainly do not expect to lose him from the editorial field of photography.

The Arlington Club of the Eastern District (Brooklyn), gave an interesting steropticon entertainment early in the month, on which occasion a large number of views by Mr. J. C. Hement (a contributor to the "International Annual"), were exhibited and received with much pleasure.

We would note that at a recent meeting of the Boston Camera Club, Mr. Wilbur C. Brown was elected to fill the unexpired term of secretary, caused by the resignation of Mr. E. F. Wilder. And in this connection we would state that in the list of American Societies, published in the "International Annual," the date of organization of this club was printed 1881 instead of 1886, as it should have been.

Our attention is called by Mr. C. B. Talbot, of Tacoma, Washington, to the fact that photography is about to play an important part in a political movement of great moment to Portland, Oregon, and that each voter who deposits his ballot is to be photographed at the same time that his vote is recorded. We believe this to be the first instance of the kind on record, and the results are awaited with considerable interest.

Some excellent advice has been given by the veteran, Mr. Abraham Bogardus, in a recent article to amateurs, in which he urges great care in all the manipulations of the dark room, and the use of the best apparatus and materials only; the development of your own plates, and the greatest possible deliberation in all steps. He advises beginners never to attempt portraits, and especially of friends, who will often find fault with the results and heap ridicule on the operator. And finally, perseverance, until the subject has been mastered in every way.

A large and enthusiastic party, representing the Hartford Camera Club, took part in an excursion, in the latter part of May, and captured many beautiful views, notwithstanding the fact that the day was not wholly propitious for viewing. The day was most enjoyably spent by all participating.

Herr Luders, of Austria, has lately published a formula for burning in colors on porcelain, which consists in laying a fairly thick coating of porphyry glazing, mixed with gum arabic, on a specially prepared paper, which, about twelve hours before use, is quickly drawn through a bath of ferrous oxalate and dried. It is then placed in contact with the negative to be printed and exposed to sunlight, dipped in distilled water and placed in contact with the porcelain to dry and the paper stripped off, leaving the design, which is then burned in.

Our good friend, Dr. Mitchell, of Philadelphia, is making an extended tour through Norway and Sweden, and, of course, it goes without saying that he has his camera with him. We wish him a delightful trip and lots of fine views.

A very convenient and inexpensive method of testing the silver bath comes to us from M. Mercier, of France, who advises procuring two dropping bottles of exactly the same dropping capacity—then dissolve

Common salt (chemically pure and dry)	6.88 grams.
Chromate of potash	0.2 to 0.3 "
Distilled water	100 c. c.

Of the silver bath to be tested, drop twenty drops into a clean graduate and add the above solution, drop by drop, with constant shaking, till the red precipitate formed turns white and the number of drops required is identical with the percentage of the solution or the number of grams of silver in 100 c. c. of the bath.

We regret to learn that ill-health has obliged Mr. Harry Duffield to resign the secretaryship as well as membership of the New York Camera Club. He proposes to leave the city in search of health which his many friends sincerely hope he may find.

A formula to prevent blisters, comes to us from one who has used it with excellent results, and which is to immerse prints between toning and fixing, in

Methylated spirits	4 parts.
Water	1 part.

omitting the old time salt water bath entirely.

We are in receipt, from Mr. J. A. Palmer, of Aiken, S. C., of a collection of views made by himself on a recent visit West, some of which are remarkably beautiful, one in particular showing a cascade of water in which the transparency of the fall and effect of light and shade combined with the full detail in foreground are seldom equaled.

The souvenir and programme of the Third Annual Exhibit of the Yonkers Camera Club is before us, and is gotten up in a very effective and tasty manner. The exhibit is a large one and the pictures, to judge by a few which have been reproduced in half-tone, must have been fully up to the mark.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Measuring the Speed of Instantaneous Shutters—Mat Varnish with Toluol—The Sensitometer Question—Zeiss's New Lenses.

Professor L. Weber, in Kiel, has published recently an entirely new method of determining the speed of instantaneous shutters. A test hitherto in general use was to let some bright object swing in a circle in front of the camera and to take an instantaneous picture of it. The swinging object will

describe upon the plate a circle, increasing in size the slower the movement of the shutter.

Londe had a different way. He writes the vibrations of a tuning-fork upon a movable plate. A piece of tin with a hole is fastened to a tuning-fork, behind which a strong light source is burning. The focus is taken upon this illuminated hole and the instantaneous shutter is mounted. The plate rests in a sliding holder, which by weights and rollers is moved in one direction during exposure. If the shining opening in the tin is at rest it will depict a line upon the plate in consequence of the movement of the same. If the tuning-fork vibrates with the opening the latter will draw a wave line. If the tuning-fork vibrates one thousand times a second, each wave which is seen on the plate will signify a second. The number of waves that can be counted will of course increase according to the duration of exposing the instantaneous shutter, and these can be obtained by Londe's arrangement in exactly $\frac{1}{1000}$ of a second. Londe has shown how unreliable the publications of the tradesmen are about the duration of exposure of instantaneous shutters. Thus the actual time of exposure of different shutters was:

$\frac{1}{20}$	second,	that is	$\frac{7}{12}$	of that	published.
$\frac{1}{40}$	"	"	$\frac{4}{5}$		"
$\frac{1}{100}$	"	"	$\frac{2}{5}$		"
$\frac{1}{25}$	"	"	$\frac{1}{4}$		"
$\frac{1}{100}$	"	"	$\frac{1}{5}$		"
$\frac{1}{35}$	"	"	$\frac{5}{9}$		"
$\frac{1}{40}$	"	"	$\frac{2}{5}$		"
$\frac{1}{110}$	"	"	$\frac{7}{11}$		"

Therefore only one figure is correct ($\frac{4}{5}$); all others are nearly twice to four times too high. Londe says there are very few instantaneous shutters which have only $\frac{1}{100}$ second time of exposure; the quickest made according to his order having $\frac{1}{250}$ second.

Londe's method appears now the most complete one. But, notwithstanding all its complications, it is not free from defects. As soon as the shutter opens, the edge of the objective is first of all only exposed, and this acts only in a lens with very small diaphragm.

In consequence of this the picture will lack light, and only when the objective opens more the light point will be sufficiently clear to act. Londe obtained therefore with a strong light twenty-four, and with a weak light only twenty-one waves. The defect is therefore $\frac{3}{1000}$ of a second. This defect is not very great. Still Londe's very complicated arrangement will be purchased only for physical laboratories. Weber's new method will be so much more welcome to professionals and amateurs. The principle of it is that one-half of a plate is exposed free for one second against a bright screen uniformly illuminated; the other half by means of the shutter to be tested is directed upon the same screen. The slide is first drawn about one-eighth of its length, after which ten exposures take place; then another one-eighth of the slide is drawn to give again ten exposures. This is continued to the end, and divisions are thus obtained which have experienced 80, 70, 60, 50, 40, etc., instantaneous exposures.

If the plate is then developed, the one half will blacken uniformly, the other half according to the number of instantaneous exposures will not be uniform.

The place is easily recognized which corresponds in intensity of blackening with the other uniform half. If this required fifty exposures the exposure of the instantaneous shutter will be only $\frac{1}{50}$ second.

We have to remark, of course, that the exact comparison of the blackenings requires an experienced eye, and the beginner will easily make mistakes. But the eye will soon become used to it.

Lainer in Vienna gives in the following a very good formula for mat varnish with toluol:

Ether	100 c.c.
Sandarac	10 "
Toluol	34.50 c.c.

The sandarac is finely powdered, put into the ether, and after being dissolved the toluol is added. It is not very easy to coat plates uniformly with this mat varnish, but it takes the pencil very well.

The photometer question prevails again in the minds of a good many photographers. It has been determined, by manifold experiences, that the favorite Warnerke photometer does not deserve its reputation. The degrees rise too slow, and then they do not rise as mentioned in the table. My Warnerke's photometer shows very slight differences in the transparency between seventeen, eighteen and nineteen. Then the light source (the phosphorescence-plate) is quite an unreliable thing, whose brightness sinks rapidly after irradiation, so that time differences of a few seconds may cause the greatest mistakes.

In Warnerke's sensitometer the degrees rise just as they do on my older one for carbon printing, in geometrical proportion, that is, if the light quantity necessary for the production of the commencement action is for degree $1 = n$, it is for degree $2 = n^2$, for degree $3 = n^3$, for degree $x = n^x$.

Taylor and myself constructed another photometer, which in place of the transparent scale has a number of tubes (pipes) over the sensitive plate. These are closed with tin, into which one, two, three, four, five to twenty-five equal openings are bored. The brightness in these pipes under three openings is of course three times as great, under four openings four times as great as under one opening; it is therefore proportional to the number of openings. I considered this instrument, whose degrees are not in a geometrical but in an arithmetical proportion, formerly a decided success; but I must acknowledge now, that I am obliged to drop this opinion for the following reasons:

The brightness of the single degrees of the pipe-photometer is in proportion to the number of holes in each pipe under which the plate to be tested is exposed. Thus under No. 1 (one hole) the brightness is twenty-four times as weak as under No. 24 (twenty-four holes); if, therefore, two plates are exposed an equally long time to the same light under the photometer, and the number ten appears for the one in the developments and for the other one No. 24, it means that the brightness under ten, which is only $\frac{10}{24}$ of the brightness under twenty-four, makes just as strong an impression as the brightness under twenty-four; the first plate will, therefore, be in the proportion of 10:24, therefore nearly two and a half times more sensitive.

Here we get therefore the proportion of sensitiveness direct from the proportion of the number of holes under which the first impression becomes visible; this is an essential advantage in comparison with the scale-photometer, whose

degrees advanced according to geometrical proportion, and by no means are in the same condition as the degree numbers.

But aside from these advantages there is also a great disavantage—the unequal intervals between two degrees. Thus the light strength under one hole is half as great as under two holes. If the light quantity under two holes is called one hundred, the light strength must therefore increase one hundred times to produce under one hole the same commencement action as under two.

The conclusion is, that if for instance one plate shows No. 2, a plate twice as sensitive would bring forth in the same time the No. 1 ; but a plate one and three quarter times as sensitive, would not bring forth No. 1, but also No. 2, even if more intense, so that under such circumstance, plates will prove equal according to the degree number, whose sensitiveness is in proportion of 4:7.

The brightness H, is proportional to the number of holes m. Thus the brightness increases from n to $n + 1$ as 1×100 by per cent., it differs therefore at every degree ; very much, if m is small, very little, if m is large. It has therefore to increase at degree 10 to 10 per cent. if the initial action is likewise to be produced under degree 11. An increase from 5 to 8 per cent. remained therefore certainly without action; just so great is the defect. If in this manner degrees 19 and 20 are compared, differences of 5 per cent. will be observed and then at least 3 per cent. mistakes can be made.

With regard to the initial action there are also again defects, which make the instrument as good as useless with regard to the degrees 1—20. Only from 20 to 25 they will keep within the limits of defect of ordinary photometry ; but they are different for each interval. The question, in how far differences of 5 per cent. will show by the initial action, we consider yet an open one.

It is different with the scale-photometer. If the number of scales is x, and the brightness under one scale $\frac{1.}{n}$' the brightness under x scales will be $\frac{1.}{n^x} \cdot$ n^x times as much light has therefore to fall upon the x scales to exercise the same action (initial action) under x scales, as the light power 1. under 1 scale. The degree $x + 1.$ requires therefore n^{x+1} times as much light.

The light quantity increases, therefore, if after degree x degree $x + 1.$ is to become visible, by $n^{x+1} - n^x$. If we calculate this by per cent. beginning by n^x, we obtain

$$\frac{n^{x+1}}{n^x} \times 100 = (n - 1.) \times 100$$

1. This demonstrates that the increase of light by per cent from 1 degree to the other is equal with all degrees of the scale photometer.

2. That this increase is equal to the one of a reduced absorption-coefficient for one scale multiplied by 100*

The conclusion herefrom is, that the scale photometer has indeed advantages which the pipe photometer does not possess.

In my photometer the increase amounts to $0._{27}$ from one degree to the other ($n - 1. = 1._{27} - 1. = 0._{27}$), this multiplied by 100 gives 27 per cent.

But by the selection of a less strong absorbing material in which n is smaller, a more moderate growth of the degrees can be obtained. If, for instance, n is $= 1._1$, then $n - 1.$ will be $0._1$, the addition from degree to degree

* By absorption coefficient is understood the number with which the original light power has to be divided, to obtain the light power reduced by absorption after passage through one scale layer.

will therefore be only 10 per cent. Then the defects remain within this number, 10 per cent.; if $n = 1_{05}$, they remain within 5 per cent. Thereby it is in one's power to make the scale photometer rise quicker, that is, to make it more sensitive.

It is, therefore, necessary that the scale photometer is exactly constructed from uniform layers, and that the scale is not too large. Warnerke's scale has too large an absorption coefficient, the single degrees rise by 34.7 per cent. of the next lower ones, admitting thereby mistakes to 30 per cent. This should not be.

About the Zeiss objectives I have reported already last year. All the experience gained in the meantime confirms that they are the most excellent instruments that have been placed upon the market lately. Evenness of the visual field, great angle, finely cut sharpness, demonstrate their excellency. No trace of light spots can be seen.

I make quite frequently enlargements with them. All other objectives will produce a red or blue edge around the picture field, and only the Zeiss objective shows this edge absolutely white.

BERLIN, MAY, 1891.

NOTES FROM A DISTANT LAND.

BY ROMYN HITCHCOCK.

THE various photographic journals which come to hand here in China are read with interest. The BULLETIN holds its own with any of them for value, and is perhaps better known here than the English journals. The recent retraction by Dr. Emerson of all he has said upon "Naturalistic Photography" can hardly be taken seriously except we regard him as a man convinced against his will, who, it has been said, remains of the same opinion still. But it seems to me that he has injured his own case by a savage attack upon Mr. Davison, which I am rather surprised to find in print in the *British Journal of Photography*. The subject is really of less practical consequence than numerous correspondents seem to suppose. A much more practical matter is the proposition to survey certain unexplored and extensive tracts of the Republic of Mexico by balloon photography. The scheme is said to be both feasible and economical, and it has been strongly recommended. But perhaps it will be found that balloons are rather troublesome to manage, and somewhat dangerous as well, unless they are securely tied to the ground, in which case they cannot be used to explore the wildernesses of Mexico. A balloon is an excellent and rapid mode of conveyance from one place to some other place, but there is a difficulty about getting back again.

I notice that a Mr. B. Hains, of New Albany, has undertaken to photograph all the caves of Indiana with magnesium light. It is a very creditable piece of work to have already made a picture of a chamber 1,000 feet in circumference and 185 feet in height, and it would be interesting to know how much magnesium he used, in what form he used it, and all the details of the work. Presumably he used flash-lights distributed in different parts of the cave. This reminds me of some of my own flash-light work in Japanese caves in 1887-88, which, so far as I know, were the first cave pictures taken with the flash-light.

I have several times seen in photographic journals an item to the effect that a Japanese, named Azurizawa Ryochi Nichome Sanjukanboz Kiobashiku, was a new claimant for the discovery of photography in colors. The gentleman is

not known to me, but there is a slight error in the matter. His name is Azurizawa simply, and all the rest is his street address in Tokio, no doubt, if anybody should wish to write to him.

In the last number at hand of the BULLETIN I notice some seasonable remarks by the editor on "The Question of Exposure." It is quite true that if one knows that a plate is over-exposed before beginning the development, he can sometimes correct the error. I had a good opportunity to try what could be done in a case of great over-exposure recently. A friend asked me to assist in the development of two plates, which had been sent to him from the interior, and for which he preferred not to be held responsible if they turned out bad pictures. The only information we had was that they were exposed ten seconds in sunlight, with a diaphragm of about half an inch opening, subject—a group of people. That was enough, however, for certainly the exposure was ten times too long. Nevertheless, both pictures were excellent. Development was begun by placing the plate in water containing bromide alone, then using a developer, very strong in pyro, weak in alkali, with some bromide. As soon as the picture appeared the developer was poured off, and the bromide solution again used to stop the action. Then the developer was again applied, and thus the picture was slowly brought up and kept under perfect control. I had done this before, but never with plates so greatly over-exposed, and I was surprised at the excellence of the results. I should add that in all such cases the negative will be thin, for if development be long continued, until the lights are dense, the shadows might become covered. Therefore, it is preferable to make a thin negative and intensify it after fixing.

In Dr. Scott's table, which you give in the article mentioned above, I notice that at twelve o'clock the light in June and December is as 1 to 4. Now, I am curious to know how many workers in the United States find that proportion to be true. Certainly it is not a universal rule, for I know that in the far East, where most of my work has been done of late years, I do not even double my time of exposure from June to January.

One cannot safely rely upon any tabular statement of the strength of the light. I have a sort of sliding scale for my record book, in which 1 indicates the strongest light of the season when the exposure is made. If the air is perfectly clear and the sun at its brightest, then I mark the light 1, and I do not pretend to compare season with season. As a matter of fact I find that about three seconds exposure now is about equal to four seconds during the past winter at Peking.

In the same BULLETIN I notice an account of the new graphol developer. A specimen of that compound was recommended by a gentleman here, and we tried it. It worked very slowly. The gentleman told us he liked it because he could set the plate away for an hour or two to develop by itself, and it would not become too dense. But that is not the most commendable feature of a developer for general use. The probabilities are, therefore, that the mixture does not keep well, and what we had was already spoiled.

I recently had occasion to renovate some discolored eikonogen powder, and this is how it was done: I dissolved the substance in water, then acidified the water, when the eikonogen, or rather the acid basis thereof, was thrown down as a fine powder which settled slowly. The liquid was then drained off, the deposit thrown on a filter and washed with acidified water. After draining well

it was spread on a plate of glass to dry. Chlorhydric acid is the best to use, although any acid will do. Sulphuric is not to be recommended. It is not even necessary to dissolve the eikonogen in the first place, for washing it with acidified water will accomplish the same result, and even more conveniently. I obtained from 429 grains of discolored eikonogen 310 grains of a fine powder of a light color—"crushed strawberry" my wife calls it—which dissolves immediately in the alkaline solution used in developing.

There are many ways of removing hyposulphite from the film, but really there is scarcely a more harmless compound in a negative than a trace of sodium hyposulphite. The compound we wish to remove is the silver salt, and most hypo-destroyers decompose this double salt and leave the silver in the film. For this reason they do more harm than good. We want to get rid of the silver. The best way to do this is to place the negative, after it is apparently fixed, in a fresh hypo bath, after which there is rather less danger from imperfect washing.

One contributor to current literature has said a very curious thing about people who go to be photographed. He says many of them should wash their faces! Now that would never do in this country, for most of the beauty, in native eyes at least, would wash off. The other day I photographed a woman with a face as red as a beet, and lips excelling the glow of a ruby. I did not fancy the style of beauty, but no retouching for freckles was necessary.

I hope my rambling notes are not too long for your valued pages. I might go on in the same way for another hour, but it is so late that I shall give your readers and myself a rest.

TEINTSIN, CHINA.

AN AMATEUR'S VISIT TO AN AMATEUR EXHIBIT.

BY ADELAIDE SKEEL.

IF photography, like sketching, be "drawing around the think," one has no reason to be surprised to find such a variety of subjects represented in the Fourth Annual Exhibition of the Society of Amateur Photographers.

The first delightful impression one receives on entering the gallery, and the last on leaving it, is that the exhibitors have had something to tell, and have told it in most cases fairly well. There is of course more or less straining after effect and not a little posing in some instances where the technique is excellent, notably in 293–300 (Miss Barnes's work), but these cases are the exception to prove the rule, and probably if this artist had not been so frank telling us of her studio devices, we would never have suspected scenery and stage accessories. What a pity it is not to be Argus eyed at a photographic exhibition! I was charmed with Mr. Charles Howell Miller's views, 7–13, and unqualified in praise of the success with which he has worked many different processes, but doubtless others in the last numbers of the catalogue showed as good work, and only my tired eyes after an hour's looking failed to see it.

Passing on to another class of subjects from the genre, Mr. H. A. Latimer's land and sea scapes, particularly the latter, are of great merit. I am not sure our naked eyes see quite all Mr. Latimer's Euryscope lens shows us in a breaking wave, but I know his prints are marvels of beauty, if possibly, like Maybridge's trotting horses, they tell more than we are meant to know of motion. I am so firm an adherent to bromide paper that I am sorry to confess 117 and 131 contrast

sadly in disfavor of the latter which is gray and measly compared with the clearness and brightness of the albumen tones.

Mr. and Mrs. Anckorn have attempted a great deal, 161—but their success together with that of Frank M. Sutcliff, 162–166, makes us Americans tremble for our laurels. To be sure these English amateurs have close at hand what seems to us more picturesque surroundings, yet on second thought can the loveliest county in England offer richer subjects than those shown in Dr. Nagle's exhibit 333–335?

Miss Clarkson's pictures also emphasize the fact that one can idealize if one happen to be an idealist, as satisfactorily at home as abroad, while the technique of her work does much credit to Chautauqua.

There has been so much said and so well said concerning atmosphere in photographs, about the necessity of sacrificing detail sometimes to breadth of views, and the inartistic folly of stopping one's lens down till a plate shows up an equal sharpness over its whole surface, that fewer errors of this sort occur in this exhibition than in former ones, but a triumph of impressionism is reached in 444. Miss Madeleine Smith gives us a portrait never to be found in a professional's gallery, and we who are sick to death of retouched faces and enameled surfaces thank her most heartily.

I have passed over many, many good things, and can only close with a word of praise for the platinotype views of Mr. Richard Keene. They are well executed, well mounted pictures of interesting subjects, and one wishes his more widely known countryman, H. P. Robinson, 178–180, had done himself equal justice.

Finally, the amateur turns away proud and humble. If others do so well, he thinks, why not I? Are some buyers of outfits and hand cameras predestined to glory and others to failure at the outset without the interposition of free will, or is a decided taste for taking pains, an attention to details, a love of the best results to be received as an earnest of coming laurels to crown amateurs to-day unknown?

Written for "International Annual."—Received too late.

HOME PICTURES.

By H. H. Williams, *Charlottesville, Va.*

I don't mean by my title, "Home Portraits," for they may be anything but "pictures." I mean photographs of home subjects that are worthy the name of "pictures." Judging from the photographs seen on the walls of our exhibitions, 90 per cent. at least of the great army of the camera users never get beyond landscapes (or waterscapes) and portraiture.

Now, there are a few of us who think that it is a much higher aim to make a picture that will tell its own story and interest the person who looks at it.

Take, for instance, the picture in one of these annuals of the lad "watering his horse." Does not this pretty little picture at once tell its own story?

How different had the two lads been just standing by the well "having their pictures took." All who have seen Mr. H. P. Robinson's well-known work will have noticed what simple materials he makes his splendid pictures out of. For instance, his "Dawn and Sunset," an old cottage room, a buxom young mother and her baby, full of life and vigor, and an old, old man, just as near the end of life as the baby is to the beginning, these combined with what a writer in

one of our journals calls "bromide of brains," make a picture worthy of the artist it is by.

For my part, I value one little photograph of this class more than twenty of the best landscapes ever taken.

To make a good genre picture needs careful thinking out, good models, tact and great patience.

You have no need to wait for the summer holidays or to go away from home; you can find material in plenty in your own home. I have seen an excellent picture of this class of four ladies at afternoon tea, one has her hat and jacket on, and the looks of the others proclaim that she is retailing the latest piece of "scandal."

In this instance all the preparation needed was placing the table near one end of the room and one lady putting her out-door things on.

These two instances will show what can be done with scenes of every-day life, as the simplest incidents will often make the most beautiful and pleasing pictures.

One thing I must impress very strongly; you must have your whole picture thought out in all the details before you attempt to do the work.

Keep your eyes looking around for pictures of this class, and when you see one try and reproduce it.

Good models are of the greatest value if you wish to do genre pictures. I have been most fortunate in having several friends who make most excellent models, and who entered into the spirit of the thing thoroughly.

Don't be discouraged if you do have a few failures; try and find out why you failed, and don't do it again.

There are many good photographers who can't do a picture of this class, and still more who won't try.

ABOUT INTENSIFYING WITH MERCURIC IODIDE.

BY P. C. DUCHOCHOIS.

At the last meeting of the Photographic Section of the American Institute a discussion arose between Mr. Newton and myself about the intensification by Maxwell Lyte's process. Mr. Newton stated that certain of his lantern slides were so intensified by treating them first with the potassic mercuriodide, then fixing in a solution of sodium thiosulphate (hyposulphite).

This term fixing—which in photography means dissolving the unreduced salts from the photo-film—originated the discussion.

I maintained that a cliché was not intensified but reduced by operating in that manner, and for this reason :

When a cliché is immersed in a solution of mercuric iodide, the silver constituting the image is transformed into silver iodide by taking up one atom of iodine from the mercuric salt, which is thereby reduced to mercurosum and precipitates upon AgI with adherence.

$$Ag_2 + 2\ HgI_2 = 2\ AgI + Hg_2I_2.$$

In this state the cliché is intensified and requires no after treatment. It suffices to wash it thoroughly. But if it is then fixed, the silver iodide necessarily dissolves in the sodium thiosulphate solution while the mercurous iodide is decomposed with formation of mercuric sulphide :

$$Hg_2I_2 + Na_2S_2O_3 + H_2O = HgS + Hg + 2HI + Na_2SO_4.$$

It is true that the brown red color imparted to the cliché by HgS is favorable to printing, but in reality the intensity is reduced, for the color does not compensate for the opaque mixture of silver and mercurous iodides.

Now—and that is without any doubt what Mr. Newton intended to say—if the cliché intensified by the process in question be rapidly treated by an old fixing bath or, better, flowed with a dilute solution of the same, then the silver iodide will remain mixed with the sulphide and mercury from the mercurous iodide decomposed, as shown in the equation. The chemical changes which take place in the present case are likely more complicated : the double silver thiosulphate $Ag_2Na_4\ (S_4O_3)_3$ is formed, and not being soluble the usual actions occur with formation of silver sulphide. Whatever it may be the cliché is truly intensified.

To conclude, it is evident that Mr. Newton and I were discussing on a word; how often this happens for want of proper definitions !

Now, I must say that the meeting was one of the most spirited I have assisted at for a long time.

The exhibition of lantern slides by Professor Laudy was most instructive to those interested in the study of microphotography; that of my old friend Roche splendid as usual, and that of Mr. Newton quite interesting from an artistic point of view.

Mr. Newton said rightly that in a photograph, as well as in a painting, the linear perspective should be true and the aerial not neglected, the defectiveness of most photographs being the want of the latter, and often of the former by using too short focus lenses.

To demonstrate it he showed us on the screen projections from the same negatives, one slide made without regard to atmospheric effect, the other made to that purpose, and verily the difference was striking ; one of these slides I considered as a master work of photography.

Every one has remarked how differently are the landscapes treated by an Italian and a Dutch painter. The reason is that in a country where the air is dry and limpid all appear bright and sharp on the sky, while in a country like Holland where it is charged with moisture, the vapors swarming in the atmosphere modifying instead of accentuating the outlines, everything seems to be surrounded by the air, the degrees of distinctness also decreasing with the distance; in a word, the aerial effect is incomparable.

In England the hygroscopic conditions are similar to those in the Netherlands, but not in this country; the air is dry. How shall we produce those atmospheric effects in the positive photographs since we seldom can obtain them in the negative clichés? Mr. Newton tells us how to do it. It suffices to operate with most rapid plates instead of slow ones. The effect is then produced by a slight fogging of the image, as shown in the projections given for examples. It is evident, and in this only I do not agree with our learned president, that it can also be done with slow plates by pre-lighting or after-lighting, as we used to do when we worked the wet collodion process, but for another purpose, that is, by exposing the plate rapidly to a weak light before or after the exposure time. It can be done by over-exposing. However, the rapid dry plates have here an advantage, they require an exposure ten times less and can be fogged easily during the development by well known means.

On the whole, the process devised by Mr. Newton is an improvement, and should be mastered in order to produce pictures technically and artistically good, which is the aim of every true photographer.

[*From the Photographische Rundschau.*]

WORKING WITH ORTHOSKIAGRAPHIC (ORTHOCHROMATIC) PLATES.

BY L. DAVID AND CH. SCOLIK.

(Continued.)

Production of the Color Filter.—As already repeatedly said, it depends upon the color condition of the object to be taken, whether a lighter or darker yellow glass is to be applied. Although experience is the principal guide in this respect, we shall have occasion to give later on several points to lead in the right direction.

If plates could be produced whose orange and yellow sensitiveness surpasses the blue sensitiveness about 80 times, no yellow glass would be needed. But as it is, the blue has to be reduced to that degree in which (in proportion to yellow) it has to appear darker. The lighter the yellow glass is, the more the blue will act upon the photographic plate; the darker it is, so much more yellow and orange will obtain valuation. This fact has given cause to the mistaken idea that ordinary plates reproduce also the colors in their correct proportion of brightness if the blue is held back by yellow glasses and the exposure is extended until the yellow has sufficiently acted. But this is not possible, for the reason that yellow does not act upon ordinary bromide of silver, and only to a very small degree upon bromo iodide of silver, while the blue exercises some influence. If this was not the case views could be taken by lamp light on ordinary plates, which would have to show a correct proportion of brightness.

The material of which the color filter consists is of essential importance upon the duration of the exposure and the sharpness. Thus yellow glasses, of certain kinds of glass, will admit the passage of light corresponding with their color only very faintly.

Such glasses which have not been colored in the mold, but have only a yellow flash, that is, whose surface is only colored, have further always the effect of unsharpness. This is not so much the case with objectives of short focal distances (*e.g.*, portrait lenses) as with those of long focal distance. But even yellow glasses colored in the mass may effect unsharpness, if not completely plano-parallel. Nothing but plate glass should, therefore, be employed always.

The coloration of the yellow glasses has sometimes a greenish, and at other times a grayish, yellow shade; both kinds absorb a great deal of light. It can, however, be easily discovered which glasses show a purer yellow if held against the light side by side. The preference is to be given to the more fiery ones in comparison with the more grayish and less transparent ones. The best comparison of the yellow glasses is made by taking a view of a color table. If in the negative, which is obtained at normal exposure, the field corresponding with the blue is too much covered, while yellow and orange appear too dark, the yellow glass is too light. But if blue appears too dark, and yellow and orange lighter than they appear to the eye, it is too dark. By the necessary duration of exposure it is perceptible, while yellow glass at otherwise equal action absorbs less

light, and is therefore to be preferred. Those who have a spectroscope at their disposal can readily make the necessary comparison. The inserted yellow glass has to extinguish almost entirely the blue of the spectrum band; the green, however, should be partly visible, so that the F line can be recognized if the spectroscope is directed toward the sky.

The yellow glasses, if not required for any particular and exact purposes, can be personally produced by coating a white glass with aurantia collodion, which is obtained by adding 2 grams aurantia to about 250 c.c. of plain collodion, shaking the same until dissolved and precipitated. With this collodion the plate glass—completely clean—is coated in the ordinary way. If a brighter color filter is required less aurantia is taken; to obtain, on the contrary, darker glasses, the coloring matter should be increased or a second collodion coating should be added. As the fine collodion coating can easily be scratched, the plates should finally be varnished with a varnish to which aurantia has always been added. For this purpose a small quantity of japan varnish is taken, in which aurantia has been abundantly dissolved. It is then filtered and finally diluted with uncolored japan varnish. The latter is easily obtainable in market.

Yellow glasses produced in such a way have a great power of resistance.

Under the influence of light these films will blush gradually and have then to be replaced by new ones. The aurantia collodion films show a very handsome fiery yellow, and surpass in effect all yellow glasses by admitting the passage of green, yellow and red, requiring, therefore, a shorter exposure than glasses colored in the glass.

The main difficulty connected still with the application of the yellow glasses consists in the unavoidable focal difference resulting when the yellow glass is inserted in front or behind the objective. One is therefore forced to focus with the already inserted yellow glass, which is extremely difficult, as with dark objects the details can hardly be distinguished upon the ground glass. This defect is remedied to some extent by giving the yellow glass its place in the diaphragm slit, whereby the focal difference is greatly reduced and can much easier be balanced. But even this mode is surrounded with difficulty, the objective being either cut into or the diaphragm slit has to be widened in such a way that a special shutter has to be fixed to close the slit opening, if the objective is to be used for other purposes. It is here also necessary to provide the camera with a measuring arrangement to move the ground glass exactly so much backward or forward, so that the focal difference is removed.

That method is better where the yellow glass is introduced into the objective in such a manner that diaphragms are employed whose inner opening has a rabbet into which small, exactly fitting rings with yellow colored glass disks, completely plano and 1 mm. thick, can be secured. The possibility is here offered to focus in the ordinary way, and to introduce the yellow diaphragm subsequently without obtaining the focus differences just now referred to.

But this method has also its disadvantages. In the first place the yellow glass can be had only with great difficulty, and the expenses, which should be considered, are pretty high, as many glasses of different sizes and shades would have to be acquired.

Another method that may be recommended is to replace the yellow glass by yellow colored strong collodion films, whose simple manner of preparation is connected with only very little expense. These films, on account of their ex-

treme fineness give a focal difference which is hardly perceptible, and requires by no means such a long exposure as colored plate glass, because they absorb almost no light. These color filters are also not applicable on objectives of long focus and particularly for reproductions, which require sharpness and exactness (for instance line-drawings, maps, charts, etc.) For this purpose plano-parallel plate-glass or plano-parallel polished glass baths filled with coloring matter solutions, as described below, are to be preferred.

The production of the collodion films is very simple: A very clear plate glass is well rubbed off with talc, then, in the well-known manner, flowed with a mixture of 4 per cent. plain collodion and dimethylorange (methybrin) or with aurantia collodion (which is prepared in the above described manner, and to which, according to the greater or less intensity desired, more or less coloring matter is added) and laid upon a leveled surface to dry. This has to take place in a warm room, as otherwise the film would become mat.

As soon as the covering is dry, the edges are cut, the collodion films are stripped and preserved between paper. The sizes are then cut according to requirements. The sheets are completely transparent, uniformly colored, without structure and with sufficient power of resistance. They are now fastened to the diaphragms with gum arabic, by pressing the collodion film which rests on the paper on to each diaphragm, withdrawing then the paper and stretching the film with the fingers as much as possible. Any small wrinkles that might form will do no harm and can be quickly removed by stretching the film again firmly.

(*To be continued.*)

THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES.

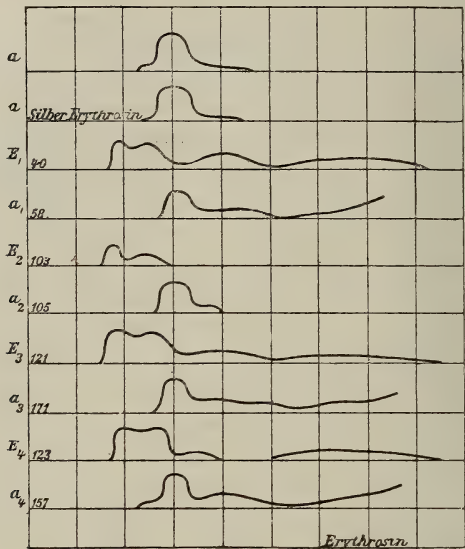
BY J. J. ACWORTH, PH.D., F.I.C., ETC.

(*Continued.*)

Erythrosin.—Tetraiodfluorescein, $C_{20}H_6I_4O_5K_2$ is probably of all the eosine dyes, the one which has received the most attention at the hands of physicists and the one which has been the most experimented upon in regard to its color sensitizing powers with reference to the so-called "orthochromatic photography." In gelatine the absorption is characterized by an intense band in practically the same position as that of tetrabromfluorescein; on the more refrangible side the smaller band appears to be wanting, and from E the absorption rapidly descends to $E\frac{1}{3}F$ then fades away at a little beyond F. The silver salt of this dye is insoluble only in water containing $AgNO_3$. I prepared this salt and, after washing it sufficiently, dissolved it in distilled water and then added it to thoroughly purified gelatine. Gelatino-silver erythroside shows a spectral absorption practically identical with that of the potassium salt.

For rendering emulsions color sensitive, I employed various quantities of the dye ranging from 5 to 25 per cent. of the AgBr present. I have since, however, experimented with very small quantities, less than $\frac{1}{10}$ per cent. with similar results. For rendering emulsions "orthochromatic" this latter amount is quite sufficient. Curve No. 40 represents the sensitiveness of an emulsion containing 5 per cent. of erythrosin to the AgBr present. Sensitiveness begins at $C\frac{2}{3}D$, rises at once to a maximum at D, thence descending to a slight minimum, and again

rising to a second maximum at $D\frac{1}{3}E$, descending, however, again at $D\frac{1}{2}E$, almost to nothing just before E, after which it again rises to a lesser maximum at $E\frac{2}{3}F$, becoming nothing beyond F, and showing but little sensitiveness in the blue violet.



The principal absorption begins at $D\frac{2}{3}E$, and quickly reaches a maximum. At E it rapidly descends, at a little distance beyond F it again rises to a second small but wide maximum, decreasing again before G, after which it rises once more.

Curve No. 103 represents the sensitiveness produced by adding 25 per cent. erythrosin to the AgBr present. The difference to be noticed in comparison with curve No. 40 (sensitiveness curve) is that here yellow green sensitiveness has gained considerably, but at the further cost of blue violet sensitiveness, as is shown in the drawing.

The absorption curve No. 105 shows a close relation to its sensitiveness curve. Its displacement is very considerable, this being always the case with erythrosin-dyed emulsions.

Curve No. 121 represents the sensitiveness of an emulsion to which 1 gram erythrosin and .06 gram $AgNO_3$ had been added to every 2 grams AgBr present, and no ammonia. This curve is very similar to that of No. 40. The absorption also compares with that of No. 58 (absorption of No. 40).

Curve No. 123 represents the sensitiveness of the same erythrosin silver bromide emulsion as that which gave Curve No. 121. In this case, however, no free $AgNO_3$ was added, but 5 c.c. ammonia, S. G. .937, instead to every 2 grams AgBr present. There appears but slight difference between the sensitiveness of this emulsion and that of No. 121. This slight difference appears between $E\frac{1}{3}F$ and $E\frac{2}{3}F$, where there is a gap in the curve. The absorption is also slightly different, as can be seen from the drawing.

With an ordinary finished bromo-iodide emulsion containing 5 per cent. erythrosin to the AgBr present, I made, in order to determine whether ammonia was essential for obtaining color-sensitizing effect, the following experiments. The emulsion was divided into three parts:

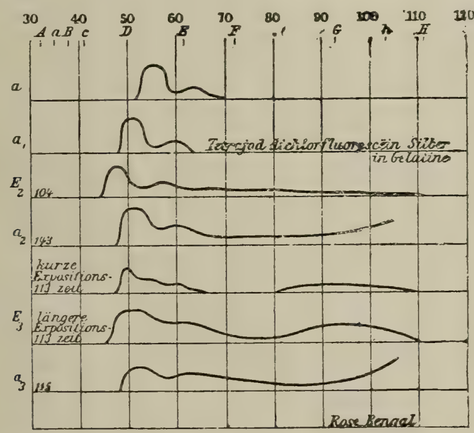
To 1 nothing further was added.
" 2 .25 c.c. ammonia to every 2 grams AgBr present.
" 3 .25 " " and .08 gram KBr to every 2 grams AgBr present.

I found that there was but little difference as regards qualitative spectral sensitiveness, but only as regards their total relative sensitiveness or rapidity, and, considering the rapidity of

No. 2 to equal	1
No. 1 would equal	$\frac{1}{3}$
No. 3 " "	$\frac{1}{6}$

and the spectrum pictures with these relative exposures would be practically similar.

Rose Bengal.—Tetraioddichlorfluorescein, $C_{20}H_4Cl_2I_4O_5Na_2$, resembles eosin and fluorescein in its solubility in water. Its silver salt is, however, unlike those of the former in being practically insoluble in water. In gelatine the absorption of the dye begins at $D\frac{1}{6}E$, and rises at once to a broad maximum, descending again at $D\frac{2}{3}E$ to a minimum at $D\frac{5}{6}E$, rising again to a smaller maximum just beyond E, from which it quickly descends to nothing. Its silver salt in gelatine is characterized by a considerable displacement of its absorption toward the less refrangible end of the spectrum. It begins at $C\frac{2}{3}D$, and becomes a maximum at D–$D\frac{1}{4}E$. The second maximum occurs just before E.



For sensitizing purposes I used from .02 to .1 gram of the dye to every 2 grams AgBr present, using ammonia in all cases, and sufficient free silver to combine with the dye. Curve No. 104 represents the sensitiveness in which the larger amount of the dye was employed. The chief sensitiveness band commences at about $C\frac{1}{3}D$, rapidly rising to a maximum, followed by a minimum from D–$D\frac{1}{3}E$, again rising to a second small maximum at $D\frac{2}{3}E$, from which it decreases to nothing in the blue violet.

The absorption begins at $C\frac{1}{3}D$, rising at once to a maximum at D, descending to a minimum at $D\frac{2}{3}E$, rising again to a maximum at E, from which it falls to almost nothing at $E\frac{1}{3}F$, beyond which there is but little absorption. The absorption of this emulsion is very strong; its displacement in relation to sensitiveness is not very great, but considerable if we compare it with the absorption of the plain gelatine-dyed film.

Curves No. 113 (short and longer exposures) show the sensitizing action,

using 1 per cent. of the dye to the AgBr present. There are several slight differences between the sensitiveness of this emulsion and the former containing more dye. With less exposure, sensitiveness commences at $C\frac{2}{3}D$, rises to a narrow maximum just before D, descending thence by two broad steps to nothing at $E\frac{1}{3}F$, showing only little blue violet sensitiveness beyond. With longer exposure the curve is very similar, but more extended, as shown.

The absorption is very similar to that of the more intensely dyed plate, the variation naturally following the sensitiveness curve of the former (less dyed emulsion).

(*To be continued.*)

[*From the Photographic News.*]

NOTES ON PORTRAITURE.—No. II.

BY H. P. ROBINSON.

I HOPE I shall not get angry in this paper. There are certain things I feel strongly, and may perhaps state with too much force.

In photographic portraiture we are running in a groove, and little effort is made to get out of it. This is, after all, perhaps not to be wondered at when we consider the influence that fashion exercises in almost every detail of our lives. It is therefore of little use to abuse professional photographers for not striking out into a fresh path; they have to get a living, and must supply the demand of their customers. At present fashion demands that every face shall be made to look like polished marble, regardless of life, likeness, expression, texture, or nature, "the same with intent to deceive." But such deception deceives nobody, for nobody now believes in photographic portraits as likenesses. Such attempt at deception is not far from painting the natural face and dyeing the hair, and it does not want an expert to detect the fraud at once. Deception of this kind, therefore, does not answer the end which it had in view; it deceives nobody but the vain victim who thinks that the marble gloss substitute for the bloom of youth is natural to her. Education in art has not advanced far enough to enable these silly people to see that the unnatural retouching of to-day destroys photographs as works of art, and renders them valueless as documentary facts. This excessive polishing is acting an untruth, and should be held in the same detestation as falsehood with the tongue. Even if it were successful, it is well to remember the wise aphorism that tells us that "those who conceal their age do not conceal their folly." Not that I would abolish retouching; for in judicious hands it is a valuable aid to a better representation of nature; but I would have no mercy on the retoucher until he had educated himself into a frame of mind that made him look aghast at his present productions. Of course I speak only of the ignorant retouchers, not more, perhaps, than nine out of every ten, for I know there are some who understand the anatomy of the face—how to respect it, what to do with it, how far to go, and when to let it alone.

Then, notwithstanding what I have said about photographers having to obey their patrons, I cannot but think that some effort after improvement, or if not improvement at least some alteration tending toward improvement, might be made in the styles of portraits. For instance, the ordinary cabinet vignette head is undoubtedly a good style of portrait, very easy to do, though not always well done; very effective; a very good means of eliminating difficulties that may arise from the possible awkwardness of the figure, and for shirking unmanageable composition. But we have had thirty years of it; we have produced them by the million, and they are beginning to be a trifle monotonous. Cannot we add a background? It is true we are very bad at backgrounds, but cannot we improve? We usually make our portraits upright; cannot we make them horizontal for a change? We usually make our sitters, in a full length,

appear to stand on their feet, or, more often and awkwardly, on their toes; cannot we make them stand on their heads? This latter suggestion is not, perhaps "within the limits of civilization," but it partly suggests what I mean. In short, cannot we get up a revolution? Photographers ought, by this time, to be sufficiently exasperated with the monotony of their work to be ready for anything—even to the extreme extent of putting their portraits out of focus.

It is now time, perhaps, to be a little more serious. I recognize that my reader has every excuse here for asking the question, "What do you recommend? Suggest something, or forever hold your peace." I cannot say that I can comply with the request. The something new must be evolved by the photographer himself.

He must try to be individual, and not rely on imitation. I know there is a great difficulty; I know that the mass of humanity will not make pictures as well as portraits. As I write I receive a bundle of photographs from a photographer whose business is in a smoky town in the north of England. He thinks his lighting is in fault, or his manipulation. Well, they are. But I sorrowfully confess that very little could be done to improve his portraits of such sitters. It is as well to let them have their half-a-crown's worth and go away satisfied, which, perhaps, they would not do with anything more delicate or better, anything they were not accustomed to. There were some heads among them that would have made good pictures if properly managed, but not portraits. Even on these cheap cartes the retouching demon had left his scratches; the old coal miner had lost his wrinkles, and the hallelujah lass smirked under the added grace of puffiness.

I have urged the photographer to be more individual and strike out lines for himself, yet there is something to be said for the other side—combination; or rather, they should be individual, and yet combine. They may have their own styles and sizes in their general work, and yet combine to push one kind of picture; to make a certain class of picture so fashionable—I am sorry to have to use the dreadful word—that it must be had regardless of trouble to the sitter, or expense.

Nothing ever increased the business of the photographer as the carte-de-viste mania. Men who were in the depths of despair suddenly found themselves in the height of prosperity. This continued for some years, until the existence of a good thing induced competition, brought down prices, and vulgarized the style. Perhaps nothing did so much to spoil the business as the attempt to give too much for the money; not so much the giving of a large number for the price charged, as the cramming of the largest possible figure into the small space. The original carte represented a full length figure justly proportioned to the space; then half-lengths and head vignettes were introduced for the purpose of giving a more visible head, and the style got confused. It went on until the heads were made so large that, when put in an album, the end of the nose of a profile and the back of the head were hidden by the opening, and in full-lengths the head touched the top of the mount, and the feet the bottom, so that all proportion was lost, and the sitters looked like a race of giants. If anything as popular should ever be introduced to the fortunate photographer, it will certainly be something very simple. When it comes, it would be well to let well alone, and not improve it off the face of the earth.

I cannot help thinking that for general purposes something more sketchy than the ordinary heavy looking portrait would find favor with the public. For this the platinum processes seem to offer great advantages. A light-figured background may be so vignetted in a platinum print as to suggest clever sketching with a lead pencil, and yet be truly photographic. It only requires to mix a few platinum prints with the ordinary pink albumenized paper horrors to show how refined the former are, and how utterly vulgar the latter. Why is this pink paper so universally used for business purposes, and so seldom for exhibition? In the last Pall Mall Exhibition the hangers had, in mercy, to remove the pink prints as far as possible from the platinums. There was reason in the light grayish blue tint first applied to albumenized paper; it neutralized

the tendency to a sickly yellow to which this paper was rather prone; but it succumbed to the law of decadence which seems to insist that all good things shall degenerate, either by adulteration, or a pandering to vulgar taste. And so the pearly beauty of the first tinted papers has degenerated down to pink and mauve, which colors are gradually becoming stronger, and are the ugliest in the spectrum—no, not in the spectrum (all colors are pure there), but that ever came out of an aniline dye manufactory.

[*From The British Journal of Photography.*]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

Chapter XI.—A Head, and how to Retouch it.

(*Continued.*)

In past chapters we have, more or less, minutely discussed the various points in a negative where the artistic assistance of the retoucher is most needed, and fixed in our minds, I hope, the necessary and beneficial treatment for same. In case, however, we may have lost or forgotten any of the various details, it may be advantageous to now take a head and retouch it. By this means we can exercise our memory upon its treatment and, when necessary, firmly fix any points which may have been but lightly remembered, if not altogether forgotten.

Sometimes, in long and minute descriptions as to the treatment of the various parts of the face, portions may easily be forgotten or escape our notice which are absolutely necessary to enable us to successfully produce good and artistic work. My intention, therefore, in this chapter, is to run quickly, yet thoroughly, through the retouching of a head, and so find out and strengthen the weak points in our study of the subject.

For this purpose we cannot do better than select a head as full of natural characteristic markings as possible, as well as one possessing the varieties of light and shade at the same time. I can mention, as an example, the heads of two very noted personages which will tax the skill of the retoucher to the utmost to do them justice. Heads full of character and expression, symbolical of the active and intellectual lives the owners have led; heads literally covered with characteristic markings, and none of which should be removed. To obliterate any of these markings would be to detract from the natural intelligence of the portrait, as well as to lessen our chance of ever producing an artistic and truthful representation of the original. The portraits I refer to are those of Cardinal Manning and the Right Hon. W. E. Gladstone. I have seen very many pictures (photographs) of them both, but very few indeed which did them justice. The head I have before me, and which I intend treating, is a better all-round subject perhaps; but for those who have not such a specimen, I can safely recommend the study of a good photograph of either of the gentlemen whose names I have mentioned.

The head I have before me, and which I propose, as far as words will allow me, to retouch, is that of a gentleman (almost full face) of about fifty-five to sixty years of age. I will endeavor, as far as I can, to give my readers an idea of what he is like, as well as the effects of light and shade depicted upon and influencing the expression of his features. The head is posed, as I said before, in such a manner as to present almost a full-face portrait. The tone of the skin must have been ruddy and healthful, rich in color, if I am to form any judgment from the general half tone which completely covers the lower part of the face, from the eyebrows down. The shape of the head generally is what may be termed square, but at the same time it is highly intellectual and pleasing. The expression is firm but not harsh, and the majority of the characteristic markings of the face are rendered with a blackness and intensity that

are alike objectionable and exaggerated as they are untrue to nature. By careless treatment such a head as this may very easily be spoiled. All heads more or less square and possessing as much half tone or shade of such a general character as is to be found in this specimen must be treated cautiously, as they are very liable to be made round by the process of retouching. To the most casual observer the truth of this will appear evident on examining a few so-called Rembrandt pictures. It is but seldom, in pictures so lighted, that the natural features and muscles of the face are preserved as they should be, the retoucher through carelessness or want of knowledge softening them all away, losing the natural squareness, and evidently forgetting everything else in his desire to secure an even grain and pretty effect for his work. Of course, his work so carried out may be very effective, but it is not true to nature, and consequently fails to possess artistic merit. Besides, this intense desire to secure a grain I hold to be a very great mistake, for never in life do we see the skin of our fellow-men so represented. If they are never so in nature, why should we, in retouching, struggle to represent them as they are not?

The forehead is square, having defining shadows showing up its natural formation on both sides. The lines between the eyes are very firmly marked, so much so that one might almost say the brows were knit. The corners of the eyebrows come to almost a sharp angle at the starting-point of the nose, and a rather heavy shadow is thrown over the eyes, owing to their square or heavy formation. The cheeks are very slightly hollowed, but this is more the hollowing in natural keeping with the squareness of the subject rather than the falling away of the flesh consequent upon advanced years. The shadow or furrow running down from the side of the nose is well marked upon both sides of the face. The mouth is rather straight, lips somewhat compressed, showing great firmness and determination of character. This is still further accentuated by a shadow running right round the under lip, and which will require considerable softening, but must not on any account be taken quite away, for by so doing we would undoubtedly detract from the vigorous expression of the feature, if we did not altogether lose it. There are shadows falling from each corner of the mouth which will require treatment; they are absolutely black. They must be rendered transparent, but not removed. The lower shadows around the eyes, those marking the socket of the eye, are very strongly marked; the light catching the skin between same and the lower eyelid, producing a baggy effect, must also be modified. There are lines also running horizontally across the forehead which must be retained, although softened, or much of the beauty of the portrait will be lost. The chin, too, in the picture I have before me, is flat and square, being in general harmony with he rest of the face. I cannot say if this description will enable the student to realize for himself the head I have taken for a model. I only wish I could reproduce it here for the reader's benefit, as it is a very exceptional subject for a study. To those who fail entirely to grip the idea of such a head as I have tried to describe, I would recommend the purchase of a cabinet head of a gentleman about the age above stated, and having as many of the markings indicated as possible, then mark in those wanting, yourself, with a little water-color, so as to keep before your mind's eye the various points as you proceed to retouch. (I will see if it be possible to arrange for the issuing of this study, and so save the reader further trouble. I have no doubt I could if there were a number likely to be wanted.) In the meantime, however, assuming that you have a fair idea of the head in question, we will proceed to retouch it.

Starting as one would with an ordinary drawing, we will begin with the forehead, penciling away all the unnatural roughness or irregular, dirty bits of shadow, which are meaningless, and in many cases only photographic defects. Great care, however, must be taken, when softening the shadows running down each side of the forehead, not to obliterate them or even to retouch them in such a manner as to impart to them a round appearance, which would be most dreadfully incorrect and out of all keeping with the general expression of the head. In what we may call cleaning

the forehead, we must be very careful not to remove all traces of the wrinkles running horizontally across it. The indications of their presence may be ever so slight (they should never be too strongly marked), but they are essential to the beauty of the picture.

We have next to treat the lines or shadows between the brows. If too strongly marked, these lines give the appearance of a frown to a portrait, and necessarily make it unpleasant as regards expression ; if left untouched, this might cause the original to refuse it as a successful likeness. We must, therefore, soften them very considerably ; but, like the wrinkles in the forehead, on no account must we obliterate them. They may also be left somewhat deeper in tone than the frontal wrinkles. In a younger head, very often these markings may with advantage be taken almost away, leaving but an indistinct shadow, which is necessary to preserve the true shape of the forehead. If sharp shadows be formed at the angles where the brows join the nose, they should be softened so as not to appear too harsh and hard in their formation. Much expression is contained in these markings, and their judicious treatment may have much to do with securing a pleasing and successful portrait. The shadow thrown over the eye by the rather heavy formation of the brow must be slightly worked upon in order to make it somewhat more transparent. In doing this, a few strokes of the pencil will prove sufficient, as too much work on this part of the face would easily ruin your picture. The markings around the eyes will next want softening. Too much care cannot be bestowed upon these very important formations, for they not only help the expression of the eye, but they have also much to do with the shape of the cheek. Many retouchers take these markings out too much, while others leave them too strongly indicated. Care and practice alone can enable you to secure the happy medium.

The cheeks, which in ordinary pictures may give absolutely no trouble, in this picture are of very great importance and demand a very careful treatment. Owing to the predominance of half tones in this study, if careless we are likely, in securing even a delicate and unobjectionable grain, to produce the effect of roundness. This would be fatal and out of all keeping. This picture so treated would be completely ruined. In such a portrait as we have set before us, consistency must be preserved in all the features, or else the result would be an absurdity which would not bear the inspection of people competent to pass a sensible opinion. The slight hollow in the cheeks must be fully, although lightly, indicated.

The shadow from the side of nose, too, must be lightened, but not too much. Care as well must be taken to preserve a proper relative and perspective strength between the one on the light side of the face and that on the dark side. More than one thinks, at first sight, depends upon the successful handling of these markings. They may be made to hold the balance of the face. Should the shape of the nose be offensively irregular, we must alter it. If the light gives the idea of crookedness to it, we must so work upon it that straightness and regularity will take its place. Yet this must not appear too evident in our method of carrying out the alteration. When even a nose is very irregular, be sure not to do too much to it ; you must not impart to it a shape it has not got. Work it in such a manner as to better its own shape, but still adhere to its general bearing. A little may sometimes make a very considerable difference to a portrait, and with care and practice the necessary judgment will be acquired to ensure success in the treatment of this feature.

Sometimes a dark shadow is thrown on the upper lip by the nose ; this should be simply cleared, that is to say, made more transparent by a few touches to infuse a little light into it and so relieve it from its quality of heaviness. If left untouched, this heavy appearance would be greatly increased by the fact that the surrounding parts were rendered more brilliant by the retouching. The shadows falling from the corners of the mouth should be softened very much. These shadows, however, should not be retouched too much, or they would fail to aid the expression of the mouth, and, on the contrary, would impart a feeling of hardness to the feature. The shadow under the

ower lip will be found to require lightening, softened and cleared up only, so as to reduce the severity of the expression; taking it altogether away would have anything but a beneficial result. In a well-lighted head all these little markings are invaluable, and should not be removed except at the expressed wish of the original or the people by whom you are engaged and under whose orders you work. The mouth and its surroundings demand the most extreme care and attention—no trouble should be spared to master the various influences which may affect its shape and expression.

Here there is much expression in the chin. It is broad and flat, but every modulation in it is worthy of preservation. Rounded, it would be abominable; and too much worked, it would become expressionless. I will conclude by drawing attention to the manner in which the work on the face must approach and join the hair; also with the whiskers down the entire sides of the face. If not carefully attended to, a hard line will assert itself where the hair and whiskers begin. Such would never be if due attention were bestowed upon the work as it progressed. The first and most essential thing to be remembered is, preserve all the half tones you can; and if you do this, hard lines can never result from your work. A very small amount of work will render dark shadows transparent, so never fall into the habit of overworking them—it is losing both time and effect. Over-work in the treatment of a negative will only produce a hard, wooden effect, and in nine cases out of every ten falsify the natural expression and ruin the resemblance. Needless to say, retouching carried out on the over-work principle can have no pretensions whatever to the artistic.

A MEANS OF PRINTING FROM NEGATIVES HAVING EXCESSIVE CONTRASTS.

BY JAMES McGLASHAN.

[A Communication to the Edinburgh Photographic Society.]

I COME before you to-night to show a method of printing which, after a number of trials, I have found most successful with a certain class of negatives that would not give satisfactory prints by the ordinary method. There are some subjects from which, expose as you like, a good printing negative cannot be obtained. I allude to interiors, where the lights are in great contrast to the shadows. If a short exposure is given to such a subject, the lights are obtained all right, but usually there is very great density in such parts and very little detail in the shadows, consequently in printing to the requisite depth, either the detail in the lights is not obtained, or that in the shadows is over-printed and lost. If, on the other hand, a long exposure is given, halation or reversal is the result, and a negative is obtained from which it is impossible to get a print with the true values of the light and shade.

The method of overcoming the difficulty which I have to show you is so simple, and so self-evident, that I cannot but think that it has been tried before, but as I have never heard of its being previously tried, and as some of my amateur and professional friends thought it of great value, I submit the result of my experience to you in the hope that it may be useful.

The importance of being able to get satisfactory results from this class of negatives cannot be overstated, as such subjects are among the most difficult with which photographers have to contend, and an easy means of overcoming the difficulty is certainly a great *desideratum*.

Ordinary sensitized silver paper is made to print from negatives with a certain ratio between the shadows and high lights, consequently the negative has to be produced subordinate to that. It is different with bromide paper, where the result may be varied, both by the exposure and development.

A negative with very little contrast may be made to give a very satisfactory bromide print, and the same with one having very great contrasts. However, if halation is induced in a negative, no method of printing, so far as I am aware, will get rid

of this fault. Reversal has begun, and no means can overcome the evil. It is with printing-out papers principally that I have to deal. I would suggest here that for the negatives a normal exposure be given to such subjects, and the plate be not forced, so that the true relation between the lights and shadows be retained—that is, the contrasts produced in the negative as they appear in the subject, and then by subsequent treatment the result may be printed, so far as the whiteness of paper as high lights and the darkened silver as shadows will show.

I might have entitled this paper with great aptness "Compensation Printing," because the faults of the negative give its remedy. No matter how great the contrast may be, it is possible to print through the high lights of the negative and prevent the shadows at the same time from being overdone.

My first attempt to solve this difficulty was with a church interior, where there was only one window which caused trouble. I made a mask, from which I cut out a piece corresponding to this window, and in order to locate it, made the mask out of a lightly fixed print, from which I cut out the piece wanted.

This answered its purpose admirably, but trying the same procedure with another negative, where the strong lights were more erratic, I could not succeed in the same way. In this case the idea occurred to me to use simply a light print as a mask, which itself would allow the light to be transmitted in a graduated manner most readily to those parts of the negative which were densest and at the same time cover the thin portions. I found it was a complete remedy, and by varying the depth to which the mask was printed up, any desired result could be obtained.

The mask is prepared as follows: A piece of ordinary sensitized silver paper is exposed under the negative and printed up to the required depth to suit the particular negative. I would say lightly for one in which there was not very excessive contrast, and pretty deeply for such as have the contrasts most marked. This is fixed, washed, and pasted on a piece of glass somewhat larger than the print. In order to use it, it is laid on the front of the frame so that it is about a quarter of an inch from the negative, and the subject allowed to print in the usual way, but it may, with advantage, be used in direct sunlight. If the mask causes the high lights to print up more than they should do, it can be removed when they are nearly right, and the shadows then allowed to print up to the required depth. It does not seem necessary that very great care need be exercised in placing the mask in exact register with the negative, it need only be approximately so.

Interiors, however, are not the only subjects which may be treated in this way, as any negative which has from under-exposure or other cause been rendered hard can be printed from satisfactorily by this means.

The only objection, and it is a small one, to be urged against the method is that it is comparatively slow, but the sun charges nothing for shining, and if a good print is desired, one must just wait till it is done perfectly.

I need say no more on the subject, as you will have been able to see at a glance of what value it is; and as I myself have received much useful information at these meetings, I hope my small quota will be found of service to the members.

[*From Philadelphia Ledger, June 18, 1891.*]

COLOR PHOTOGRAPHY.

Mr. Frederic E. Ives made an important communication at the stated meeting of the Franklin Institute last evening upon the subject of his process of color photography, in the course of which he explained and illustrated some recent improvements he had made in the means of operating the process, by which it is rendered comparatively simple and reliable, and capable of immediately profitable commercial operation for lantern illustration. When Mr. Ives first published his process, several years ago the three negatives requisite were made in one camera from one and the same point of

view, but last night he showed that, by an improvement on his helio-chromic camera the three negatives, representing the effect of the object photographed upon the three fundamental color-sensations, are now not only made from one point of view, by simultaneous and equal exposure, as they were three years ago, but also upon a single sensitive plate; so that the helio-chromic negative is obtained with no more trouble than an ordinary one, and any number can be made in which the relation of one element to the others is exactly the same. The color prints, also, can be made from these negatives by a single exposure, in transparent gelatine, and separated only when ready to dip into the dye solutions representing the respective color-sensations. Mr. Ives showed, however, that it is not necessary to go to the trouble of making the color prints when only lantern illustrations are required. Lantern positives, made from the helio-chromic negatives with no more trouble than ordinary lantern slides were projected on the screen in the natural colors in the ordinary lantern, by means of a special front of Mr. Ives's own devising, and which was substituted for the ordinary projecting lens in about one second, so that an exhibition of ordinary lantern slides can be interspersed with projections in natural colors without causing any delays in changing from one to the other.

Several such projections were shown, including some admirable views in the Park, and they were received with prolonged applause. The approximation to the colors of nature were marvelously accurate. The positives were about one-third smaller than the ordinary projections, but were as sharply defined, and in as bright and true colors as those produced two years ago with the more elaborate and troublesome lantern. The lantern front used for these new projections consists of three prisms, converging light from a single condenser and radiant to three small projecting lenses, the necessary color screens being located just behind the objectives. Mr. Ives also showed one of two cameras which he has devised to produce the heliochromic negatives, in which three negatives are made on a single plate, the image-forming rays being transmitted to the single gelatine dry plate through three reflecting prisms, and from points of view so close together (less than half an inch apart) as to make perfect registration easy of accomplishment. By the other camera the three negatives will be made from the same point of view. Mr. Ives also announced that he was at work on a scientific novelty in the form of an optional device for the table, in which these positives could be seen in the natural colors as readily as stereoscopic views are seen in relief in the stereoscope.

Mr. John Carbutt said that he considered Mr. Ives's latest work by far the most important and valuable contribution to the difficult subject of photography in the colors of nature which had yet been made. He moved a vote of thanks to Mr. Ives, which was agreed to.

OUR TWO ILLUSTRATIONS.

The frontispiece of this issue of the Bulletin is another of those capital compositions of our good friend, Theodore Brinkmeier, and in which he appeals so forcibly to that "touch of nature that makes the whole world kin." We heartily commend this picture—"On Guard"—to the study of all lovers of photography, and especially to those who are envious of their richer brethren with expensive cameras; this picture was taken with a so-called cheap outfit, but the work accomplished is worthy of a far more costly equipment.

The second plate is a series of studies from the studio of that world-renowned artist in photography, Mr. H. P. Robinson. We must apologize for the reproductions, which owing to the great reduction in size from the original prints, are of a poor character. Nevertheless, they give the thought of the artist in each

case, and serve as excellent examples for studies in composition. The ideas are there, if the photogravures are faulty. Those who would like copies of the original pictures should write to the publishers of the Bulletin.

THE ANNUAL FOR '91.

Messrs. Editors and Publishers of the "International Annual":

I have been reading to-night the "International Annual" for '91. It is full of interest and has held me closer than a romance for several hours, and I shall have to give many more hours of study to it before I gather the full crop of good things its well-written and beautifully illustrated pages offer. But to-night I feel moved to thank you, the editors and publishers, for the enterprise and fraternal good-will that prompted this constantly improving series of International Annuals, which gather up and make permanent these many scattered grains of valuable passing thought. What an interesting library they will make. How many thoughts are crystallized and made permanent that would never otherwise have seen the light. What a valuable epitome of current photographic thought they will make.

To receive such a beautiful book for writing my little screed printed therein, seems so much for so little, that I am almost ashamed of myself to take it; and as I look through its pages I doubt not some others feel so too. Yet there is not an article however short but contains the germ of some improvement or the suggestion of some benefit to the great army of professional or amateur photographers, scattered world-wide, yet all looking with eager interest toward these central sources of information upon this subject so near their hearts—picture making by photography, and I am sure there is not one who reads it but feels grateful to you for placing before him such a feast of good things in such elegant shape at so slight a cost, as does Yours truly,

Fredonia, N. Y. E. K. Hough.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

Buffalo, N. Y., July 14-17, 1891.

PROGRAMME.

First Day, Morning Session, 9 a.m.

Calling Convention to order. 1st. Address of welcome by Mr. H. McMichael. 2d. Roll call. 3d. Reading of the minutes of the last meeting. 4th. Report of Standing and other Committees. 5th. Selection of location for the next Convention. 6th. Appointment of Committee on Nominations. 7th. Appointment of Committee on Awards. President's Annual Report.

Second Day, Morning Session, 9 a.m.

1st. Reading of communications. 2d. Report of Committee on Nominations. 3d. Report of Special Committees. 4th. Unfinished business. 5th. New business.

Afternoon Session, 2.30 p.m.

1st. Posing and lighting. 2d. Backgrounds and accessories. 3d. Art photography. 4th. Orthochromatic photography.

EVENING SESSION, 7.30 P.M.

Art criticism on photography, illustrated by the aid of the stereopticon.

THIRD DAY, MORNING SESSION, 9 A.M.

1st. Reading of communications. 2d. Unfinished business. 3d. New business. 4th. Reports of committees. 5th. Election of officers.

AFTERNOON SESSION, 2 30 P.M.

1st. Developing. 2d. Retouching. 3d. Dry plate photography. 4th. Bromide printing.

EVENING SESSION, 7.30 P.M.

Practical flash-light photography.

Demonstrations of several lamps and the merits of the same will be shown by throwing on the screen with the aid of the stereopticon the results of the different exposures.

FOURTH DAY, MORNING SESSION, 9 A.M.

1st. Reading communications. 2d. Reports of Committees. 3d. Unfinished business. 4th. New business. 5th. Announcement of awards. 6th. Adjournment.

The above is subject to slight changes, and in addition to the above there will be several papers read on different subjects, which will be well worth listening to.

The hotel rates as given to the members of the Association are as follows:

The Iroquois (headquarters), $3 per day and upward.

The Broezel, $3 per day and upward.

The Tiff, $2, $2.50 and $3, in accordance to the room and location.

Two persons in a room, $1.50 per day each, one double bed.

The Genesee, $3 per day and upward.

The Committee on Railroads have secured special rates of one and one-third fare for round trip from all points to Buffalo. Obtain from your railroad ticket agent a return coupon, which when properly signed by the Treasurer (P. A. of A.) at the Convention, will allow a discount on the return trip.

There will be an excursion to Niagara, on Saturday A.M., July 18th, and due notice will be given during the Convention as to the arrangements for the same.

From all sources come the reports that it bids fair to be the most successful Convention yet held.

Fraternally yours,

GEORGE H. HASTINGS,

Prest. P. A. of A.

NEW RULE FOR MERCHANTS' DEPARTMENT.

Rule 8, governing Merchants' Department, Buffalo Convention, will be changed to read as follows : The art and stock departments will be opened each day at 11 o'clock A. M.

This change also necessitates calling the business meeting to order at 9 A. M., and it will be done if there be a quorum present.

This change has been decided upon because there has been so much trouble in getting the members and dealers to stop their trading and sight-seeing in order to commence the business meeting at 10 o'clock, as previously required.

George H. Hastings,
Prest. P. A. of A.

ANTHONY PRIZES AT THE BUFFALO CONVENTION.

One Hundred Dollars in Prizes for Pictures Made on the N. P. A. Albumen Paper.

A prize of $50 will be given by Messrs. E. & H. T. Anthony & Co. for the best six portraits from life; sizes to be not less than cabinets, and made on the N. P. A. albumen paper.

A prize of $50 will be given by Messrs. E. & H. T. Anthony & Co. for the best six landscapes; sizes not less than 5 x 8 inches, and made on the N. P. A. albumen paper.

A committee of three members of the Association, to be appointed by the President of the P. A. of A. at Buffalo, are to award the prizes.

CRAMER PRIZES.

Three prizes, $100 each, for the three best collections of Portrait work made on Cramer plates.

One prize $100 for the best Landscape work made on Cramer plates.

One prize $100 for the best collection of work, illustrating the rapidity of Cramer plates.

One prize $100 for the best collection of work on Cramer's new Isochromatic plates, showing their advantages over ordinary plates. Each picture to be represented in duplicate, one on an isochromatic and one on an ordinary plate.

All competing exhibits to be framed about 25 x 60 inches, with or without glass, with the photographer's name inscribed or attached thereon. Size and number of pictures in frame unlimited.

The Awarding Committee to be elected by the competitors themselves.

The competing pictures shall be placed in our exhibit and must be shipped in time, charges prepaid, to G. Gramer Dry Plate Works, care of Buffalo Convention.

AIR BRUSH PRIZES.

The Air Brush Manufacturing Company have offered for prizes this year, on the work to be exhibited at Buffalo, one air brush for the best portrait in colors, and one for the best portrait in black and white, to be made with the air brush, over print or sketch. Competition open to all.

I herewith send subscription for the Bulletin. I am very much pleased with it.

Th. Olson.

Have taken the Bulletin for ten years. It gets more popular every year.

T. S. H.

ANTHONY'S
Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.

PUBLISHED SEMI-MONTHLY.

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Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

STRIPPING THE FILMS OF GELATINE NEGATIVES.

THE following method is recommended by Mr. Jaffé, editor of *Die Photographie:* The negative, which should have been taken on a gelatine plate specially prepared for being stripped, is coated after drying with a fifteen per cent. solution of gum arabic, and the solution is allowed to drain until but a small quantity of it remains on the plate. A gelatine film, corresponding in size to the negative to be stripped, is then taken and placed for a short time between sheets of moistened blotting-paper. The film is then laid on the prepared surface of the negative and pressed against it, commencing at one edge of it and gradually giving way. In the case of large negatives, a second person should be present to facilitate the manipulation.

WHAT IS THE COLOR OF OXYGEN?

TILL now it was believed to be as colorless in the liquid form as it is in the gaseous. But the Polish chemist Olszewski shows that it is only because thin layers of it have been examined that liquid oxygen has been believed to be without color. He has succeeded in getting a layer of it 30 millimeters thick, and he finds that it has a bright sky-blue color. The discovery is very important in point of view of the absorption spectrum of oxygen.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—H. L. McC. writes: Will you please tell me through the BULLETIN what is the fault with my printing bath? Enclosed is a piece of the albumen paper which you see is almost free from albumen. My bath is 50 degrees strong, with a little nitric acid in it. It seems to print grainy from the first.

A.—The trouble with your bath is that it is not acid enough. It appears to us that it must be alkaline, for that will take the albumen off the paper just like the sample sent to us. Test the bath with a piece of blue litmus paper which should turn red if you have enough acid in it.

Q.—J. B. S. writes: My bath is neutral, 55 grains strong, I float just two minutes and blot, then dry over gas stove and fume thirty minutes or a little longer at a time. Toning.—I first place prints in water containing a small amount of acetic acid enough to redden the prints, from thence into fresh water changed through five waters of clear water, then I tone with gold neutralized with sal. soda. Gold.—I use a stock solution of 5 pennyweights of pure gold dissolved and made into almost 1 quart solution; of this solution I take 1 ounce for twenty sheets of paper; it works a little quicker than most of printers like to use; it works in two to three minutes. In this bath is where the trouble comes in. I do not get the required tones but have used the very same bath for six years. From toning I place them in the salt water; from there to hypo for fifteen minutes; then back to salt water; then the final washing.

A.—Your trouble is with the silvering of the albumen paper. The silver bath is too weak for your paper or you do not float long enough. You will see this fault if you hold the paper up to the light, you will find that it is mottled from being imperfectly silvered.

Q.—W. H. B. writes: 1. How long ought albumen prints to remain in hypo to be well fixed, one hundred and fifty prints in 100 ounces of solution, 1 to 10. 2. Does it affect the prints in any way after they are fixed to remain in running or standing water all night.

3. Through how many changes of water should they pass to eliminate the hypo? 4. After dissolving eikonogen and leaving it stand for a few days there is a deposit of white crystals; what is the cause of this and does it affect the developing?

A.—Twenty minutes is long enough to leave the prints in the hypo solution. Prints that are left too long in the water are liable to blister; they also appear to be difficult to burnish well at the same time. Six or eight changes of water, if it is thoroughly changed every time, is sufficient. The crystalline deposit in the eikonogen is of no importance, it will all go into solution when you mix the solution with the alkaline part of the developer just before using. Shake the crystals up before using or the developer will be too weak.

Q.—R. M. H. writes: Being a subscriber, I appeal to you for help through the "What Our Friends Would Like to Know" columns. I am troubled with a dim image appearing on the upper right-hand corner of my negative of the object photographed. This appears only at times, and that only when I make a view in the sunlight. To-day I made three views, two about 10 o'clock with the sun over my left shoulder and the ghosts appeared on both; about 1 o'clock I made the other, with sun over my left shoulder the same, but the ghost did not appear. I use a Darlot Rapid Hem. Lens well stoped down.

A.—Your trouble is undoubtedly due a fine pin-hole in the bellows, or more probably in the front board of your camera. Place your camera in the sunlight with a plate in it and the slide of your plate-holder drawn, but do not remove the cap from your lens, and allow it to remain some minutes in this position, then put in the slide of the plate-holder, take the plate to the dark room and develop it. If there is a pin-hole in the camera you will have a picture almost as good as with the lens.

Views Caught with the Drop Shutter.

MARRIED.—May 27, 1891, Fred. J. Harrison and Miss Lettie Rowell. We tender the happy couple our hearty congratulations, with best wishes for a long and prosperous life together.

THE WESTERN AUTOMATIC PHOTOTYPE COMPANY of Chicago, has been incorporated in Illinois to manufacture and deal in automatic photographing machines, take portraits and deal in photographic supplies. Capital $600,000. Incorporators Alfred E. Manning, W. Bancroft Jarvis and Alfred M. Gerstle.

THE STUDENT CAMERA COMPANY of New York, has been incorporated with a capital of $4,000. The trustees are E. W. Dufft, P. C. Tapley and R. R. Martin, of Brooklyn.

NEWCOMB & OWEN, of West 36th street, New York, have issued an uncommonly neat and artistic catalogue of photographic supplies. We commend it to all our readers who do business with them.

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NEGATIVE BY
GEO. H. HASTINGS, BOSTON, MASS.

PRINTED ON N. P. A. PENSÉ
EXTRA BRILLIANT ALBUMEN PAPER.

BOSTON BABIES.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. JULY 11, 1891. No. 13.

EFFICIENT DARK ROOM ILLUMINATION.

IT at first sight would appear that this subject of dark room illumination in photography has been pretty well talked out. But from some recent work of Captain Abney the topic is by no means threadbare. In a series of experiments that he has made on colored lights, he has brought out facts that are extremely useful to the working photographer.

The amount of light generally used in the modern dark room is usually about sufficient to render darkness visible. In order to overcome this difficulty Captain Abney determined the illuminating power of the different colored lights commonly used in the photographic dark room.

Taking the lights at an intensity that appeared equal to the human eye he reduced their intensity until a white screen was just visible. Starting with red light at an intensity that rendered the screen just visible, he found that he could reduce green light to one thirty-sixth part of this quantity to produce the same effect. This shows that green light is thirty-six times as strong as red light in rendering objects visible to the human eye. For the sake of comparison a table is given showing the amount of light of different colors necessary to make an object visible in their rays.

Red	3,500	units of light.
Orange	1,000	" "
Yellow	600	" "
Green	105	" "
Blue	5	" "
Violet	20	" "

From the above experiments we see that blue light is the most valuable for illuminating effect, while red light is the poorest.

The next problem that was proposed was the value of the different colored media used as screens for the ordinary dark-room lantern. In this Captain Abney was able to confirm his previous experience, that dark orange was better than ruby. For the sake of comparison in this last respect, the experiments

were made to ascertain how far an object could be moved from the source of light till it became invisible. The following figures were obtained :

Ruby medium	40 feet.
Stained red medium	120 "
Canary medium	220 "
Orange paper	180 "

From the above figures it is evident that the canary medium will be the best screen as far as the illumination of all parts of the dark room is concerned. But this light screen is not safe with the more rapid brands of dry plates. If a pure green medium could be obtained this would be the most desirable light source for the photographer. Unfortunately the various media available for this purpose, of a green color, contain too many blue rays to be of service. As a consequence we are reduced to the orange-colored light sources for the best dark room illumination.

For some time past we have used what is known as sodium light with an amber-colored lamp chimney as a screen, and we have failed to find the least trace of fog on plates developed in this light. Lamps are in the market that are constructed on this principle. One can easily be contrived out of a good spirit lamp the wick of which has been soaked in a solution of sodium phosphate and dried before it is put into the spirit of the lamp. Of course an amber chimney is necessary in this case as well as in the case of gas. If gas is used it must be burnt in what is called a Bunsen burner, and must give a blue flame without any illuminating power. The sodium phosphate is applied to the gas by a specially constructed tube that fits over the burner. The effect of the sodium phosphate is to give an intensely yellow flame of high illuminating power, and with the amber glass chimney harmless in its effect on the photographic plate. The amber glass cuts out the blue light of the spirit or gas.

EDITORIAL NOTES.

A PRIZE of 1,000 francs is offered by the French Society for the Encouragement of National Industry, for a photographic shutter which shall have a rapidity of $\frac{1}{50}$ second, the full opening length to equal one-half the time of exposure and a diameter at least one-tenth the focal length of the lens. Simplicity of construction and adaptability to different sizes of lens and kinds of work are especially sought—the prize will be given in 1892.

WE are informed that the next joint exhibition of the Photographic Society of Philadelphia, the Society of Amateur Photographers of New York, and the Boston Camera Club, will be held in Boston next Spring, under the management of the latter club, and the members of these clubs have been requested to bear this fact in mind during the intervening time, with a view to securing material to make the exhibition of the greatest possible interest and value.

WE have before us an example of work made by Mr. George G. Rockwood with the P. D. Q. camera, which is remarkable for the detail and beauty exhibited; the depth and sharpness of focus are particularly noticeable.

A NEW method of printing comes from the *Boletino Foto*, of Rome, as follows: Float the paper to be printed, on

Chloride of iron	15 grams.
Citric acid	15 "
Water	600 c.c.

and after drying in the dark, print under the negative until the image appears, then immerse in a solution of gelatine containing India ink or some similar coloring agent and wash in cold water. The pigment only adheres to the parts affected by the light.

T. J. BURTON (Society of Amateur Photographers of New York), Dr. George L. Parmele (President Camera Club of Hartford), W. H. Drew (President Lynn Camera Club), Miss Frances B. Johnston (Washington Camera Club) and H. S. Fowler (Brooklyn Academy of Photography), have been appointed a committee to arrange for the first annual exhibition of The American Photographic Conference, to be held in New York in May, 1892. It is proposed to make this exhibition the largest and most complete one ever held in this country. The foreign correspondents of the Conference have already been notified to secure, if possible, exhibits from all of the foreign societies, and it is especially desired that every society in the Conference be represented by examples of their best work.

MR. DAVIS, Secretary of the Photographers' Association of America, which is to meet July 14th to 17th, informs us that the well-known athletic photographer, Mr. S. J. Dixon, has arranged to cross Niagara over the Whirlpool Rapids on a cable on the afternoon of the 17th at about 4 o'clock.

There is no doubt that Mr. Dixon will have a large audience of appreciative fellow craftsmen to encourage him.

EFFORTS are being made in Germany to utilize agar-agar as a substitute for gelatine in the making of emulsions. Experiments are being conducted with a view to overcoming the difficulties which have been met with, and they seem to promise well.

OUR attention has been called to the fact that many of our readers are not aware that the beautiful heliotype reproduction of Mr. Wells's negative, "The Pacific Coast," which appeared in a recent issue of the BULLETIN was reversed, and consequently cannot imagine how the water could be where it was in the picture. We took it for granted that everybody knew that gelatine reproductions were almost invariably reversed, so did not refer to it. This same explanation will apply to the illustration in the present number.

WE are told that the yellow tones may be removed from negatives by soaking in a weak solution of bromine and then exposing to sunlight. After six or eight minutes the color will have left it, when the negative should be immersed in alcohol and dried.

HERR PUTZ, of Germany, has succeeded in obtaining some most satisfactory results from his experiments in the substitution of aluminium for magnesium for

flash-light photography, thin leaves of the metal, ignited between layers of collodion cotton treated with chlorate of potash, being particularly successful.

In a recent discussion relative to the remarkable results obtained by Colonel Waterhouse in his thio-carbamide experiments, attention was drawn to the fact that the silver deposit under this treatment becomes soluble, while in the early stages of development it had the same characteristics as that forming an ordinary negative.

A most interesting and valuable application of photography has lately been made in one of the leading hospitals of Paris by Professor Charcot, who has succeeded in obtaining photo-micrographic reproductions of the brain in various different conditions, which will prove of great value to scientists.

A formula, which is thought highly of, for toning and fixing aristotype paper, is as follows:

A.

Hypo	200 parts.
Ammonium sulpho cyanide	25 "
Acetate of soda	15 "
Water	800 "

B.

Alum	10 parts.
Water	50 "

After mixing the two solutions, a portion of a sheet of aristotype paper, about ⅛, is placed in the bath, and the whole allowed to stand for two days in the dark, after which it is filtered, and to it is added—

Chloride of gold	1 part.
Chloride of ammonium	1 "
Water	200 parts.

The keeping qualities of this bath are without limit, and it is said to work perfectly.

An interesting case at law has lately been decided in England, where two architects were in partnership and designed and built several buildings of merit. After a while, the partnership having been dissolved, one of the parties issued photographs of the buildings in question over his individual name as architect. For this he was sued by his former partner for libel, presumably on the ground that the omission of his name carried with it an injurious imputation. The court held that the libel could not be sustained.

The many warm friends of Mr. Geo. A. Ayers throughout the profession will be interested to learn that he sailed on Thursday, the 2d inst., for Europe, on the *Nourmania*, of the Hamburg line. His twenty-one years of business connection with the house of our publishers, to whom he came from Messrs. R. B. Appleby & Co., of Chicago, have been spent in almost constant hard work, and his trip abroad will make a very pleasing break. He will, probably, remain about two months, and our readers will unite with us in wishing him God speed on his voyage and a safe return in the fall.

THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES.

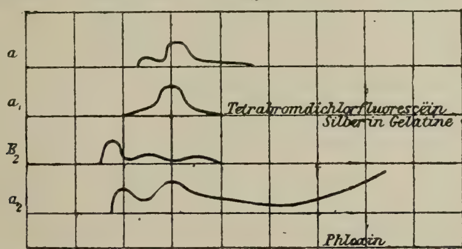
BY J. J. ACWORTH, PH.D., F.I.C., ETC.

(*Continued.*)

Phloxin.—Tetrabromdichlorfluorescein, $C_{20}H_4Cl_2Br_4O_5K_2$, is very similar in its physical behavior to Rose Bengal. It is easily soluble in water, and with $AgNO_3$ forms a precipitate not very soluble in water. In gelatine it exhibits two absorption bands, the first commencing at $D\frac{1}{4}E$, reaching a maximum at $D\frac{1}{3}E$. The second and principal maximum occurs at about $D\frac{3}{4}E$–E, after which it descends at first rapidly and afterward more slowly toward F.

Tetrabromdichlorfluoresceinsilver in gelatine shows some displacement of its chief absorption band toward the less refrangible end of the spectrum, but not so much as in the case of rose bengal (tetraioddichlorfluoresceinsilver).

For sensitizing purposes I found that .1 gram phloxin to every 2 grams of the AgBr contained in the emulsion gave excellent results. It sensitizes for three spectral districts The least refrangible, and bv far the most important,



commences at $C\frac{1}{2}D$, rapidly rises to a maximum, but becomes a minimum at D–$D\frac{1}{3}E$. The second maximum begins at $D\frac{1}{3}E$, reaches a maximum at $D\frac{1}{2}E$, then to a minimum of sensitizing action, which is maintained for some distance. The third sensitizing band lies between E and F, but is not of much importance. The blue violet sensitiveness is but trifling.

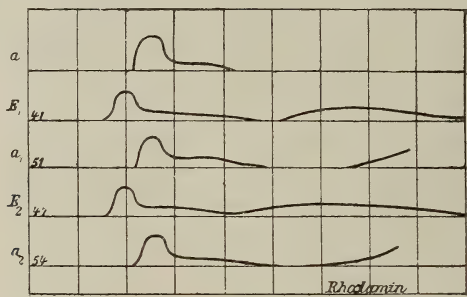
The absorption shows two maxima. The less refrangible, which reaches a maximum at D, is but little displaced in regard to the sensitiveness maxima to which it corresponds. The chief absorption begins at $D\frac{1}{3}E$, quickly reaches a maximum, but descends again at E, quickly at first, but afterward more slowly, toward G, after which it again rises. The bands of absorption maxima by no means agree with those of sensitizing action The least refrangible sensitized band is by far the most important, whilst this is represented by a band of medium absorption ; the middle sensitized band, which is by no means great, is yet represented by a band of great absorptive power.

Rhodamine.—I may here conveniently consider the sensitizing and absorptive action of this dye, as it bears some distant relation to the eosin series, being a dimethyl amidophthalein. Rhodamine is easily soluble in water, the silver salt also being readily soluble—much more so than the corresponding eosin salt. A gelatine film stained with the dye shows an intense absorption band in the yellow-green, and, in comparison with that of eosin, more toward the less refrangible part of the spectrum. The absorption begins at a little on the more refrangible side of D, rising at once to a maximum as far as $D\frac{2}{3}E$, after which it descends first rapidly and afterward slowly, and ends just before reaching F.

For sensitizing purposes I used amounts of the dye varying from .05 to .2

gram to every 2 grams AgBr present and with ammonia. Curve No. 41 represents the sensitiveness of an emulsion containing rather less than 10 per cent. of the dye to the AgBr present. Sensitiveness begins at $C\frac{1}{2}D$, reaching a maximum equally on both sides of D. Beyond D it descends rapidly at first, thence gradually, and ends at F, showing but little sensitiveness beyond.

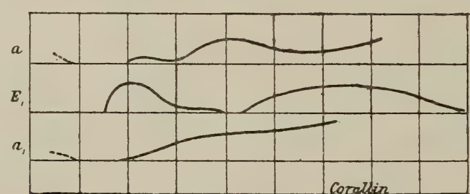
The absorption of this emulsion (Curve No. 51) begins at $D\frac{1}{3}E$, rapidly rising to a maximum on both sides of $D\frac{1}{2}E$, after which it decreases rapidly at first and gradually afterward, ending at a little beyond F; in the blue absorption again commences.



With emulsion containing less dye I got a very similar curve of sensitiveness (No. 47) and of absorption (No. 54).

Corallin.—This dye is soluble in alcohol and water; $AgNO_3$ gives no precipitate. In a gelatine film it is characterized by a strong absorption in the blue (in alcohol and water it is between the yellow and green). Absorption begins at D, but does not rise specially until E, after which it becomes a maximum on both sides of F, and then gradually descends to about G, when it shows a certain degree of continuous absorption.

For color sensitizing I used quantities varying from .05 to .2 gram for every 2 grams AgBr present. Its sensitizing action consists of a strong band extending on both sides of D, descending rapidly to $D\frac{2}{3}C$ on the one side, and on the



other side rapidly at first to $D\frac{1}{2}E$, but afterward more gradually to nothing just before F; beyond F blue violet sensitiveness begins and varies inversely according to the amount of dye present.

In corallin dyed emulsions the maximum of absorption and maximum of sensitizing action are very widely displaced. The absorption may be considered to begin only at D, and not to reach its maximum much before F, after which it keeps pretty uniform to the end of the visible spectrum.

With another dye of this series, fluorescent resorcin blue, I made one or two experiments, but, from the nature of the dye, successful results can hardly be expected. It shows, however, a weak color sensitive band at $B\frac{1}{2}C$. An absorption result was impossible.

(*To be continued.*)

DIAPOSITIVES AND DUPLICATE NEGATIVES FROM VERY WEAK CLICHÉS.

BY P. C. DUCHOCHOIS.

In 1855, Mr. Jeanrenaud communicated to the Société Française de Photographie a method to obtain from extremely weak negative clichés quite satisfactory duplicates which by otherwise operating it would be impossible to obtain equally as good.

The reader knows by experiment that weak negative clichés strengthened by any of the processes now in use, as well as the strong clichés reduced in the ordinary manner, are very often wanting in gradation or in detail, the half tones in the lights being buried in the half-lights or, as in the case of reduction, the fine details in the shadows obliterated.

The method devised by Mr. Jeanrenaud to avoid these capital defects I do not remember having seen mentioned in any of the treatises on photography published since more than thirty years. It is therefore little known at present, like many old good processes which certainly merit to be resuscitated. Hence I thought to make it the subject of a communication to the BULLETIN; moreover it will be of utility not only for the purpose in question but also to make perfect transparencies from any negative clichés, so to say, which I think to be a desideratum for the projections used in scientific lectures.

The method consists of making a diapositive and obtaining from it a perfect negative cliché.

Necessarily the difficulty resides in the obtaining of the diapositive. It is made by the camera and the collodion process which, as usual in such cases, gives the best and most certain results. I do not mean to say that good diapositives and from them good duplicate negative clichés cannot be made by the bromo-gelatine dry process, but simply this, that we operate in better conditions : we see what we are doing, or, rather, how the chemical actions proceed, which do not permit us to follow the opacity of the photo-gelatine film on one side, and the very feeble colored light we are obliged to work with on the the other ; we work nearly blindfolded.

To conveniently make by the camera diapositives and from them negative clichés one must of course provide a special apparatus. The climax enlarging, reducing and copying camera made by the publishers of the BULLETIN answers every purpose ; it is universal.

When the weak cliché is placed in the outer frame of this camera, in front of the lens, " only the luminous rays passing through the negative are admitted in the apparatus," and if one examines on the ground-glass the image of the cliché illuminated by a weak (north) light, the lights, or transparent parts of the cliché are so much enfeebled that one is surprised to see how many details become apparent. Now if, without altering the direction of the apparatus to the light, one substitutes a good cliché for the weak one, then the image on the ground-glass will appear so much more the less satisfactory as the other was good." Therefore one should project on the cliché a more or less brilliant light to obtain the desired effect ; *if the cliché is weak, the light should be weak ; if it is strong, the light should be strong* to permeate the most opaque parts of the cliché.

Different illuminations necessarily produce different effects which are seen on the ground-glass.

When an artificial light is employed, the illumination is regulated by varying the distance of the source of light to the cliché, and by diaphragms, longer focus lenses and other means which suggest themselves when direct sunlight illuminates the cliché.

The duplicate negative clichés are obtained by operating in a similar manner.

Now we see that in the two operations a very luminous image with all its details is formed by causing the light to pass through the clichés, and that as a consequence it is the light which increases the relative values of the parts which are defective in the original cliché. These effects are powerful and should be avoided in the first operation, that is, the obtaining of the diapositive from which the duplicate negative cliché is made, otherwise one would obtain an intense image difficultly permeable by light and therefore yielding counter-proofs in which the details would be obliterated. In this resides the difficulty of the method as pointed out before; difficulty, however, more apparent than real, which is easily mastered by using a light of the proper intensity, a suitable exposure time and *tours de mains*, known by every photographer, which it is not in place to describe in this paper.*

PRELIMINARY, SECONDARY, AND SUPPLEMENTAL LIGHTING.†

BY DR. J. M. EDER.

THE following interesting paper is a translation from Dr. J. M. Eder's "New Exhaustive Handbook of Photography" (Part 2, Vol. I, pp. 313–320). The subject will, without doubt, be a revelation to the professional and amateur who knows nothing beyond the commercial dry plate of the present day. In days gone by the proceeding was technically known as "flashing." Our object in reproducing the article in its entirety is a two-fold one: first, to call the attention of our readers to the exhaustive nature of Dr. Eder's labors; and secondly, to recall the possibilities of this almost forgotten method of bringing out a negative which would otherwise be lost or valueless. In our own experience we have frequently resorted to this practice, and have rarely lost a plate. Whenever we find a plate under-timed or coming up too slowly, we simply pour off the developer and expose in the tray from two to ten seconds before the ruby glass, then again pour on the developer. In extreme cases we have repeated the operation as often as four times, and almost always with satisfactory results. Again, when we had reason to believe beforehand that we were under-timed, an exposure of two-thirds seconds in front of the ruby light before development proved of service. The former plan, however, is by far the safest.

It is a proceeding, however, which requires care and judgment, and should not be resorted to unless all other manipulations of the developing agents fail to be effective. Still, in our own practice, the method as stated has proved successful with at least three makes of dry plates of various degrees of rapidity.—J. F. SACHSE.

(*a*) *In the Negative Process.*—If the daguerreotype plate, wet collodion, or gelatine dry plate, after a short exposure in the camera, is subjected to an

* Bull. Soc. Franc. Photo. Vol. I, p. 282, and Vol. II, p. 164.

† Read before the Philadelphia Photographic Society, June 10, 1891. For the discussion upon this paper see—

exposure of several seconds over the whole surface in a weak, diffused light, a favorable result will be attained.

If the exposure in the camera was gauged so short that the development resulted in an imperfect image, this supplemental general lighting continues the first action of the light so far that it results in a substantially better or perfect picture.

This action was first noticed over forty years ago with daguerreotype plates. Becquerel credited this continued action especially to the red and yellow rays, and denominated them as *continuing rays* (*rayons continuateurs*); while to the green, blue, and violet rays he attributed the primary cause of the action, and called them *creative rays* (*rayons excitateurs*).

This view was, however, soon found to be erroneous, and Moser was one of the first who recognized the fact that all the rays can commence and complete the action; later it was even proved that in actual practice it was just the subdued rays of the violet end of the spectrum which were the most active.

In the photographic practice it has been repeatedly proposed to expose the plate in the camera for a shorter period than called for by ordinary conditions, and then subject the plate for a short time to the diffused light. This proceeding is called Secondary lighting.

A similar effect is attained if the plate is subjected to an exposure of a weak, diffused light before being placed in the camera (Preliminary lighting), or if weak, diffused light is introduced into the camera during exposure (Supplemental lighting).

In all three cases a reduction of period of exposure in chief is gained, frequently, however, at the expense of the quality of the picture. The means therefore are manifold, and are described below.

As early as 1871, Schultz-Sellack declared that the "continuing" action of the light upon a weak image was not a peculiar phenomenon, but the result of the necessary primary action, which explanation contains the greatest probability.

1. *The Wet Collodion Process.*—The action of Preliminary and Secondary lighting upon the photographic wet collodion plates was discovered by Bazin in 1870. His plan was to introduce a red light on the plate either during, before, or after the exposure. This was done by aid of four openings in the front board of the camera, around the lens; these were protected with glass plates coated with a solution of carmine in ammonia, which were placed in front of a piece of brown glass.

The opening or closing of the lens achieved the same effect upon the four supplemental apparatus.

The same effect was obtained when the plate was exposed to a red light a second, either before or after exposure.

Carey Lea, in landscape photography, caused the red light to strike the plate only where the sky did not reach. His plan was to secure a red medium (carmine-stained paper) on the upper part of the camera, so as to cause the darker portions, foliage, etc. (but not the sky), to be strengthened by the red light, and come out stronger in detail. When the foliage was brightly illuminated the red medium was unnecessary.

Newton applied an opening in the first board of the camera, 2 x 5 inches. This was covered with a green glass, so that the plate was flooded with a weak

green light during the exposure. • This is said to have reduced the time of exposure from twenty to five seconds.

Newton, however, concluded that the best and safest plan was to leave the plate in the camera, and then give a secondary exposure by taking a green, red, black, or gray medium in front of the lens, and thus reflect light upon the plate.

Others again exposed the wet plates one-third to one-fourth of the usual time. These introduced a piece of yellow glass in place of the dark slide, and subjected the plate to an exposure of ninety seconds in diffused daylight (Gaenslin).

Colored papers (blue, green, brown) were also used for the same purpose, in front of the open lens immediately after the exposure (Krüger).

(*To be continued.*)

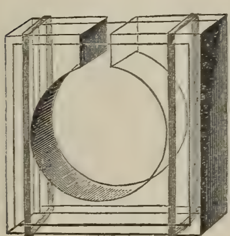
[*From Photographische Rundschau.*]

WORKING WITH ORTHOSKIAGRAPHIC (ORTHO-CHROMATIC) PLATES.

BY L. DAVID AND CH. SCOLIK.

(*Continued.*)

For all views, where it is desirable to obtain a picture of the greatest sharpness, the best means to retain their strongly refractive rays remains always in the application of a Steinheil bath. This consists of a strong (about $1\frac{1}{2}$ cm. thick) glass plate, in which is a cut-out corresponding to the objective opening (See figure). At both sides are plano-parallel plate glasses covering the cut-out, fitting closely to the glass plate greased with vaseline, and tightly held with strong rubber bands.



In this manner a vessel is obtained, whose extreme surfaces are completely plano-parallel, so that the passing rays are not differently refracted.

This bath is filled with picric acid dissolved in alcohol and diluted with water or bichromate of potassium. This solution can be made lighter or darker, that is, thinner or more concentrated, according to requirement. It is best to fix this bath in front of the objective, and care should be taken that it is exactly at right angles to the objective axis.

The larger the distance between objective and ground glass, the more difficult it is, even by application of these baths, whose cost price is pretty high, to obtain exact sharpness. In such a case nothing remains to be done, but to take the objects in artificial (yellow) light. For this the electric light with a yellow glass screen or a number of incandescent lamps with yellow glass globes is to be recommended. For smaller pictures we recommend the application of the already mentioned yellow colored magnesium flash-light, which will be referred to later on.*

* Dr. E. Albert transferred with his collodion emulsion the yellow ray-filter direct into the emulsion in such a manner, that he mixes this with a neutral yellow coloring matter, the picrate of ammonia, by neutralizing the excess of ammonia of the eosin silver solution with picric acid. In this way the application of a yellow glass is unnecessary.

Landscape Views.

It has been asserted that the orthioskiagraphic process was generally not suitable for landscapes, giving no true reproduction of them, effecting an incorrect perspective, and with regard to harmony and disposition furnishing frequently worse results than ordinary plates. This is a great mistake, and the disadvantages mentioned can result only in consequence of unskilled treatment. In some cases ordinary plates are, of course, to be preferred. If, for instance, the light parts in a sun-lit landscape receive a yellow illumination by the sun's rays, which contain red and yellow rays in excess, while the shadows reflect only the blue light of the sky, worse pictures will be obtained with yellow sensitive plates than with ordinary dry plates, the shadows acting any way weaker, and besides being strongly subdued by the yellow glass. It is further correct that by application of too dark yellow glasses the blue distance is brought out too powerful and distinct, so that the perspective effect is lost more or less. However, one will soon be convinced that by means of orthoskiagraphic plates and a light-yellow ray-filter, landscapes can be taken which far surpass those made on ordinary plates. The moderate clearing and sharper delineation of the distance (by suppression of the blue action), the shadows of the foliage, rich in detail, the light foreground and the greater richness in tones and their gradation, all these are advantages which have bestowed to such a view an attraction not attained heretofore.

If erythrosin silver plates are applied we will obtain—even by leaving out the yellow glass—harmonious detailed pictures in which trees and foliage appear handsomer than with ordinary plates. The color-filter particularly can be left off with landscapes rich in yellow tones such as autumn landscapes with yellowish foliage, evening scenes, where the whole country is gilded by the rays of the setting sun. But even with such objects it is better to apply a yellow glass light. It is, of course, understood that for such illuminated landscapes the exposure with orthoskiagraphic plates is considerably shorter than with ordinary plates.

The orthoskiagraphic process cannot be too highly esteemed for views of old buildings, parks, forest-scenery, monuments, etc.

(To be continued.)

[*From the Photographic News.*]

NOTES ON PORTRAITURE.—No. III.

BY H. P. ROBINSON.

Photography has been called every man's business. In the past the art has been a too facile refuge for those who have failed in other walks in life. The brewer, and baker and candlestick maker have found it an easier means of a narrow existence than the practice of the mechanical trades to which they had been brought up, and filled the spaces which would have been better occupied—for the credit of the art—by those who were properly educated for it. It may be said of photographers as Byron said of critics :

> "A man must serve his time to ev'ry trade
> Save censure--critics all are ready-made."

But this state of things is improving, and the best places in the business of photography are being gradually filled up by those who have been properly educated and trained to it, just as other businesses are led up to by apprenticeship or articled pupilage;

and to attempt to open a studio now without some such training would be to undertake a great responsibility.

What, then, should be the qualification of a first-rate portrait photographer? Is it a knowledge of chemistry, optics, carpentry? Certainly not. The first consideration is that he should be an educated gentleman. Not that he need be educated according to the much-abused conventional or scholastic meaning of the word, which can only see education at the Universities. What is wanted is correct language, easy manners, quick perception and insight into human nature.

To this must be added the ordinary knowledge which every educated person should possess, added to what might be called newspaper information, for daily use. He should be all things to all men, and ready to discourse with at least plausible knowledge on all ordinary subjects, and if he could make himself acquainted with a few erudite studies, or have a hobby of some scientific, naturalistic, or archæological character, it would be to his advantage. General education, then, should be the foundation on which our future superstructure should rest. Without it, or with only a little of it, our photographer may be a good photographer, and able to take a portrait technically excellent, but it would be by a rare chance if it were the best that could be done of the sitter, and in all arts and sciences—and, indeed, in all relations of life—it is better to eliminate chance, yet at the same time being ready to take advantage of any happy opportunity that may occur. The Duke of Wellington said it was the general who made the fewest mistakes who won the battle. Of course there are positions in photography where the best is not called for, or expected, but I am now speaking of the aspirant to the highest position.

The next qualification is a knowledge of art. Not merely the shallow acquaintance with it that is to be got from a few lessons in a drawing class or an art school—which, however, would be the best beginning—but the wider knowledge that embraces the history of art and a study of all the schools, from Cimabue down to the many varieties of the present time. Some of these latter are at least remarkable for their enthusiasm.

But this is a digression. Art should grow up with other knowledge; the first dawn of it cannot come too early. It is difficult for a man who has not cared for it the first half of his life to say, "Now I will begin to study art, to be enthusiastic about it, to teach it." I only know of one instance in which great art came to a man in his mature years without previous study, and that man was Claude Gellée, of Lorraine. To take an exception from our own art, Mrs. Cameron did not take up photography until late in life, and this she did without any training for art of any kind. Her portraits were full of artistic feeling, but as works of art and photography they were very immature. They were full of promise, but lacked fulfillment, although of late they have been lauded to the skies. Before her death she saw the defects of her earlier work, and was advancing to more photographic completeness.

The photographic press of the time has been recently ignorantly accused of a "vulgar outcry" against Mrs. Cameron's pictures. To say that her pictures were full of faults did not imply that there was no merit in them. The artistic merit was always recognized; it was the photographic defects that were condemned by the photographic press, not more so, however, than they would be at the present time, even by those who now virtuously profess to wonder "how critics should have existed to shower abuse" on these photographs. It was the ignorance of those outside critics who professed to admire these very unequal productions, because of their faults, that was chiefly ridiculed. There is an effect of superior knowledge and cleverness in finding beauties where they do not exist, or are not visible to others, that is irresistible to some critics, and it is not a new discovery. Sir Joshua Reynolds noticed it in his time, if we may judge from the following passage in his discourses: "So far, indeed, is the presence of genius from implying an absence of faults, that they are considered by many as its inseparable companions. Some go such lengths as to take indication from them, and not only excuse faults on account of genius, but presume genius from the existence of certain faults."

To return more directly to our subject, the future photographer, prepared as I have indicated, is now ready to study photography for professional purposes.

There can be no doubt that a course of elementary chemistry would be of the greatest use to the budding portraitist, but it should be confined to the elements. I remain convinced, as I always have been convinced, that too much science is inimical to art.

There are, of course, some minds great enough to hold the two, but the hard fact of science is apt to clash with the only half-understood feeling of art. There is a good deal that an artist does that he knows is right but cannot easily explain, and any attempt to put it under the microscope and analyze it scientifically soon makes prose of the poetry, and an exhaustive study of exact science is apt to engender a turn for that analysis which is opposed to feeling. There is a good deal of fine poetry which the world enjoys that would not stand the test of the grammarian's scrutiny, and much artistic romance that would not bear the touch of the Ithuriel's spear of a scientific Mark Twain. I must not carry this argument too far, or it would be made into an excuse for not learning anything––there is always danger in extremes––and I may lay myself open to be misunderstood. I have a great reverence for science, but think that the artist should take just as much as would be good for him, and no more.*

I know that this is not the opinion of those who usually decide upon what a photographer must learn, and that a student can get a certificate that he knows all about photography when he knows the complete chemistry of the operation short of the composition of the image; and, indeed, in strict technical truth, so he does, but he has only learned the technical application of his materials, and has yet to know how to put them to artistic use in the making of pictures, and the mischief is that when students go for the advanced science of photography they sometimes get lost in it, and the result is that it often happens that learned chemical papers are read against each other by great scientists at photographic societies to prove or disprove a simple fact that a mere tyro could easily settle by a couple of experiments.

It is pleasant to see that there is at last to be some addition made to the usual chemical course at at least one great teaching center, and that the managers of the Polytechnic Institution are about to add lectures on art as applied to photography to their programme. It is to be hoped that if a great photographic institute should ever be founded, that it should not be a mere chemical laboratory, but that students should be taught to put the art to use. Abstract science must be held in all respect, but the average photographer is a practical man, and wants to know how to make pictures.

[*From the British Journal of Photography.*]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

(*Continued.*)

Chapter XII.—A Lady's Head and Figure: their Treatment.

I HOPE I have been successful in my endeavors in the last chapter to place satisfactorily before the student the necessary instructions for the artistic treatment of a man's head. It is naturally very difficult to depict in words a head with all its many

* This paragraph was written some weeks ago, and I cannot help referring to a singular illustration of its truth which has just occurred, and will probably be announced to-day. A study of Messrs. Hurter and Driffield's scientific papers, aided by a few minor considerations, has so convinced Dr. Emerson that true values cannot be obtained by photography that with a courage worthy of all praise, and which I, his old opponent, respect, he has renounced "Naturalistic Photography," proclaimed its death and written its epitaph. The throwing up of a cherished belief which has occupied the thoughts of many of the best years of a studious life, through scientific conviction, is a heroic proceeding, which, while it commands our admiration, makes one almost thankful for ignorance, and for freedom from the nightmares of science.

natural, yet sometimes strange, peculiarities and imperfections, and then proceed to remedy them and make a harmonious and pleasing portrait by means of retouching. In the head I have just treated, vigor and broadness predominated, and, of course, these qualities must be fully retained, and not in the least be diminished by the work we place upon the negative. We may soften generally, but when our work will have been completed, the balance of light and shade should be unaltered. Of course, this only holds good in cases where the subjects are more or less correctly and artistically lighted. If, on the other hand, there be a false balance in the lighting, we should do whatever lay in our power to get back to nature and its truthful representation. In our treatment of men's heads, therefore, always let our work be characterized by plenty of vigor and broadness. Softness need not mean a lack of these qualities, but rather a correct balancing of them.

In the case of ladies' portraits we may, without indulging in any very serious wrongdoing, exercise a greater amount of freedom and license; in other words, we can without danger impart to ladies' and children's portraits a certain degree of softness which in the opposite sex would be simply absurd. Under these circumstances, as there is such a marked difference in many of the details of the treatment necessary to make a lady's portrait successful, I will endeavor in this chapter to give the student such instruction as will enable him to successfully undertake and carry out the same.

In this case I have selected a panel portrait of a lady in evening dress, as it affords most opportunity for showing the retoucher's skill, and, at the same time, exercising to the full his general knowledge and judgment while carrying out the necessary work which will secure artistic finish for our work. In portraits of this class, too, every point must be attended to, as they are generally rather expensive, and are expected to be really carefully finished, and in every respect a first-class portrait and photograph.

The lady under treatment is posed for a three-quarter view of the face, and is about twenty-five to thirty years of age, with a handsome as well as pleasant expression. Of course, being in evening dress, her neck and shoulders are exposed, also her arms; and all these various points will be found more or less to require the retoucher's help to render them thoroughly acceptable and satisfactory. By this may be understood that we have to produce a pleasant and attractive picture in order to secure the unqualified approval of the original. As in the case of the gentleman's head, I will first lay down the faults and various points demanding treatment, we can then more easily proceed to work out the changes and modifications necessary to secure an artistic as well as a successful and pleasing portrait.

The hair is very full and bushy, stretching over the brows, but not lying closely upon the forehead. There is, therefore, a goodly amount of shade on the forehead, owing to the hair intercepting the light, and so very naturally producing a shadow. There is a delicate marking between the eyebrows—not at all a frown, but simply a slight shadow caused by a tendency to fatness over the eye, and which, through a slight overbalance in the lighting, is more or less exaggerated. It is not exactly objectionable, but it may with advantage be removed, as it would not be at all observable in nature under the ordinary conditions of life. The markings under the eyes, too, are unduly strong; more especially the lower ones, which define the shape of the socket of the eye, and run down into the cheeks. The furrow running downwards from the side of the nose is a little heavy, and somewhat inclined to be straight. There is also a line or wrinkle which leads the eye from it down to the shadow, which is also rather forcibly marked, falling from the near corner of the mouth. The mouth itself requires but little, a slight touch of light on the lower lip being sufficient to bring it to a balance with the rest of the face when retouched. The chin has a slight shadow in the centre, but not a dimple.

The line of the jaw is delicate, and does not require our help, but there is a rather strong shadow on the neck, just under the chin, which must not escape our attention. The neck is round and graceful; still, where it joins the chest, there are three almost

upright shadows in the middle, and two others running horizontally, one at each side. This effect may very often be found prominently marked in a photograph, although not absolutely remarkable in life. Ofttimes the least turn of the head may produce these markings, simply the result of the light striking the muscles of the neck which are brought into prominence by the least strain in turning the head.

The bodice of the dress is rather low, but the bust is somewhat covered by lace coming over the shoulders and brought down in front to the waist in the shape of the letter V. The lace is without high lights, and is completely wanting in relief. The bodice, too, has a number of creases, which are objectionable and calculated to depreciate the natural beauty of the figure, which, in this case, is really good. The arms are well posed and lighted, and present but slight opportunity for our skill until we get to the wrists. True, there is a little shadow too strongly marked at the elbow, but two or three touches of the pencil will so soften it as to render it all right. At the wrist, however, we will find a demand for our assistance. The wrist-bone is rather prominent, and throws a very harsh shadow, which is indeed most objectionable. The back of the hand, too, is badly seamed, caused by the direction in which the light strikes it, and thereby exaggerating the natural indications of the veins and tendons. The knuckles and joints of the fingers are also too deeply marked, and would impart, if left untouched, quite a coarse appearance to the entire hand. The skin generally is marked with freckles, but not very badly.

The dress and train are of white satin with elaborate lace trimmings, all of which, in this case, come rather spiritless in the negative. There is a want, generally, of that relief and brightness which are natural to such materials. The ornaments are pearls, also suffering for want of effective lights. I hope the reader will be able to realize from these remarks and picture to himself such a head as I have before me, and which we will now try to retouch.

Beginning as before with the forehead, our first endeavor must be to touch out the freckles, and generally clean off such other imperfections as may be found upon it. As the hair is dark, great care must be taken in order to avoid making a hard line between it and the skin of the forehead. Naturally, the way to do this is to preserve as much half tone as we can. In this study we should start from the high light, which is strongest just above the eyebrow, and working from this point, keeping more and more of the half tone on the forehead as we approach the roots of the hair. There is really no difficulty whatever about this; it does not demand any very special manipulation, but it must be borne in mind. The marking between the eyebrows must next come away, and little or no trace of it need be left behind. The removal of same will not, in this case, at all weaken the portrait, as it does not truly indicate any essential formation of the skull. The eyes, being somewhat heavy, may have a little brightness imparted to them, but great care must be taken not to overdo it. The least touch, to relieve the pupil and distinguish the iris from it, will be quite sufficient.

We will take the markings under the eyes before we touch the nose. The shadow coming immediately under the lower eyelid will be found to require clearing. This must be carried out with care, and not too far. Sufficient must be retained to preserve the natural expression of the eye, and which will also add considerably towards its brilliancy. The second marking is rather a heavy shadow, and which may be said to indicate the shape of the socket. In the subject before us this is very strongly marked indeed. Let us ask ourselves, "Is it natural?" On thinking the matter over we will find a certain amount for and against. One thing which is very certain, it is objectionable; being so, we will decide, if possible, in favor of its almost total removal. It may be a natural hollow, and therefore one may consider that it should be preserved. But even if so, it must be considerably modified, for we well know it has been very greatly accentuated by the top light increasing its intensity as a shadow. Again, it may be the result of fatigue or even temporary ill-health, and under these conditions should certainly not be allowed to remain. In such cases, a safe course will be to leave it as a very

delicate half tone, not strong enough to catch the eye too readily, but still be sufficiently observable to be useful in preserving the modeling of the cheek.

The cheek itself requires but little work, simply the few freckles worked away and the skin left clean and even, but, of course, not puffy. The nose in this study requires but scant attention. Of course, the freckles and other imperfections must be removed, but that done (which is easy enough), and the light upon the nose adjusted according to former instructions, we can pass to the shadow or furrow running from the wing of the nostril downward. On the shadow side of the face this is invisible, but on the near or light side it is very strongly marked in comparison. It also, as I before stated, runs rather straight. As the impression of a face can always be improved by raising the muscles, or the shadows caused by them, we can, in this case, prove the beneficial effect of such a treatment by working the lower portion of this shadow so as to give it an outward tendency, and so raise the muscle itself.

There is a line or wrinkle which leads the eye of the observer from this shadow to the one falling from the corner of the mouth, and which may be totally taken away; for once having directed the shadow falling from the nose in an outward direction, it would be absolutely absurd to leave such a marking as this, or even any trace of its former presence. One must ever be careful to be consistent, and having made the first alteration for the bettering of the expression, the second must follow as a matter of course. The upper lip above the mouth wants simply clearing, and the mouth itself just a touch of light on the lower lip to brighten it, and so prevent it from looking dull by comparison with the surrounding parts which have been retouched. This is very essential to bear in mind when retouching some portraits, such, for example, as the one now under consideration, for without a little relief the mouth would appear like a black patch, anything but natural, being expressionless and hard.

The shadow falling from the corner of the mouth must be treated similarly to that from the side of the nose—giving an outward tendency—and in every way kept in complete harmony with the work already done. In working over the chin be very careful not to take away the indication of shadow in the center. Much of the nature and expression of the lower portion of the face would be lost if this half tone were to be completely obliterated, as well as the fact of a very different shape being given to the chin itself. Although not even an approach to a dimple, it is a marking, indicating an undoubted and distinct formation. Sometimes, as is the case at present, a ring will be visible round the neck where the collar or high dress may protect the skin from the effects of the weather; this should be softened away. It is not often observable in ladies, although quite common with men. In ladies, when it is apparent, I should think it is owing to an oversensitive skin. In all cases such a marking must be softened quite away, and when doing so, see that the shadow on the neck under the chin be not left too strong, but softened so as to harmonize with the rest of the neck. In most portraits of ladies the markings in the neck where it joins the chest, are more or less strongly indicated by unpleasant shadows. These must be softened away to almost nothing; of course, nature must not be falsified, but no offensive indication must be left. There is nothing ladies have a much greater horror of than "chest-bones," and to leave "the salt-cellars" visible would be a positive barbarity on the part of a retoucher. Flattery on this point will never interfere with success, and there is no loss of likeness possible.

In general work I always give place to flesh before drapery or other accessories; therefore, we will do what is necessary to the arms and hands before working upon the draperies, etc. In the portrait before me the arms demand but little, a few touches here and there to clear it. The shadow somewhat too strong at the elbow joint will require reducing, as in its present state it is much too heavy and dirty looking. We can with little trouble (only clearing up) pass down until we come to the hands. At the wrist—the light having caught the bones at the joints—there are some very objectionable shadows, which must be softened so as not to catch the eye. The objec-

NEGATIVE BY S. P. WELLS. HELIOTYPE PRINTING CO. BOSTON. ON CRAMER PLATE.

SURF ROCKS, AT THE ENTRANCE TO GOLDEN GATE, SAN FRANCISCO.

MADE AT 5.30 P. M. WITH SINGLE ACROMATIC DALLMEYER LENS.

tionable markings on the back of the hand, and also those on the fingers, may be taken away. In doing all this, however, try to preserve as much of the half tone as possible; for although the hands will have to be made nice and round, they must not be brought too much into prominence—they must not in the least draw attention. They are always best when they escape attention; hence a skillful operator always tries to keep them in as subdued a light as possible. I think we are now free to attack the drapery.

In the first place, those creases in the bodice must be taken away, as they materially discount the beauty of the bust; and I may here mention (although it is not required in this instance) that should ever the waist be unduly bulky or shapeless, it is well within the retoucher's duties to alter same and make it presentable. In the present picture the dress and lace, with the ornaments thereon, are completely wanting in force, no contrast of light and shade—a kind of monotone pervades the entire picture. This state of affairs we must alter. The broad effects of light on the dress and train we must put in with a small stump charged with plumbago; thus softness will be secured. After the broad lights are thus treated, the absolutely high lights can be put in with a rather blunt pencil of a softer grade than the one generally used. The pattern of the lace, too, should be helped out; not minutely followed, but the bright masses strengthened. The lights thus judiciously picked out will make a wonderful difference to any picture not originally possessing these qualities. The pearl ornaments, too, must have their high lights touched on; but care must be bestowed lest they be too hard and crude, for such a result would give the picture the appearance of having been what we call "faked up." I think this will suffice to successfully treat any ordinary negative of a lady, and will form a very useful study of a companion picture to the one of last chapter.

THE DECOMPOSITION OF SILVER CHLORIDE BY LIGHT.

BY ARTHUR RICHARDSON.

THE author described experiments which have been made with a view to determine whether silver chloride which has been darkened by exposure to light under water contains oxygen. The nature of the change which occurs during decomposition of the chloride was also studied with reference to the part played by water.

Pure silver chloride was prepared by addition of dilute chlorhydric acid to a solution of pure silver nitrate, the precipitate being washed by decantation till free from acid. The following facts were observed during exposure:

1. Oxygen was evolved, a part of which was present as ozone.

2. When small quantities of water were present, chlorine and hydrogen chloride were found in solution.

3. When a large volume of water was taken, hydrogen chloride, but no chlorine, was detected.

The influence of hydrogen chloride in retarding the decomposition of silver chloride is considered, and is explained from experimental results given, which show that even minute quantities of hydrogen chloride exercise a marked influence on the stability of chlorine water when exposed to light, the rate of decomposition of the silver chloride being dependent on the readiness with which the chlorine in solution and water interact to form hydrogen chloride. Thus, when silver chloride was exposed to light in a solution of hydrogen chloride containing 0.9 part per 100 of solution, the total chlorine liberated was 0.201 gram, of which 13.7 per cent. represented free chlorine, whilst for the same weight of silver salt in pure water the total chlorine found was 0.276 gram, of which 0.9 per cent. was present as free chlorine.

In the examination of the darkened product for oxygen, a portion of the substance was taken which had lost 8 per cent. of its total chlorine during exposure. After it had been dried at 110 degrees C. till it ceased to lose weight, it was heated in a current

of pure hydrogen, the gaseous products of the reduction being passed through a weighed phosphorus pentoxide tube. Before using this substance as an absorbent of moisture, it was ascertained that hydrogen chloride was not absorbed by it after contact for a few hours only, as the weight of the tubes remained unaltered in contact with the dry gas. The hydrogen was prepared by the action of steam on sodium, numerous precautions, which are described in full in the paper, being taken to preclude errors.

The results show that the gain in weight of the drying tubes after the decomposition of the silver compound, which lasted from seven to eight hours, is so small as to preclude the possibility of the presence of an oxygen compound in the darkened product. The darkening of the carefully dried chloride was also observed to take place when exposed to light in a tube containing dry carbon tetrachloride from which all air had been removed by boiling. From these facts the author concludes that the darkened silver compound is of the nature of a sub-chloride rather than an oxychloride.—*Proceedings of the Chemical Society.*

THE SEVENTH DAY.

To the Editors of the BULLETIN:

WITH a few exceptions, the comment of the press upon the opening of the Metropolitan Museum on Sunday has been congratulatory, and that thousands of people, to whom it has heretofore been denied, can now enjoy mental recreation on the day set apart for that purpose, is certainly a laudable provision on the part of the management. Although this necessitates Sunday work for the attachés of the institution, it is one of numerous instances where necessity excuses a few for the benefit of many; but for photographers to make Snnday a day for sittings is a breach of all civil, religious and physical laws.

That photographers throughout the country are yielding to an unreasonable demand of the public is evident in nearly all small towns, and in many of our city galleries the custom of making negatives "by appointment" on Sunday is rapidly growing. For the sitter this is quite convenient. He, as a rule, being in picture attire, and either ignoring or unconcious of the fact that he is enslaving the photographer.

Tradesmen and laborers, who themselves refuse to work more than six days, and often only eight hours a day at that, expect the photographer to give up his day of rest for their convenience; clerks, lawyers and business men will ask for an appointment for Sunday, because they think it too much trouble to put on a clean collar or change a coat during the week. The trouble to the photographer is not thought of.

For this state of affairs we alone are to blame; were it not encouraged by photographers, Sunday business would not even be thought of by the people. The appointment of one day in seven as a day of rest is as old as the race, and if nature demands for the tradesman and merchant this rest, how much more essential it is to men in our profession, who spend their days under the skylight, and in the close, unventilated dark room—even considered as a fraternity of heretics, discarding the authority of any creed, we might at least give up one day to the worship of our accomplice, the sun. We are only earth ones, and there is at best little enough enjoyment even though we grasp it at every opportunity. And to imagine you are making a dollar more in seven days than in six is a mistake, as the books of those who have tried it will prove; but even though you apparently do a slightly larger business, you degrade your profession,

shorten your life, and have the satisfaction of seeing your competitor, who has conducted his business in a dignified manner get the best class of trade and make more money than you—if the reward is commensurate to the labor keep at it. If, on the other hand you want a change, make it. Let every man reform himself, and the world will soon be better. J. A. O'Neill.

OUR TWO ILLUSTRATIONS.

The handsome frontispiece that adorns this issue of the Bulletin is from the studio of Mr. George H. Hastings, of Boston. The work of this artist has raised him to the highest rank in photographic circles in the United States, for he is now the President of the Photographers's Association of America, a position that comes from his ability as judged by his fellow artists in the profession. His work has always been of the highest character, and his honors are fairly won.

The second illustration is a process print from one of those excellent instantaneous pictures made by Mr. S. P. Wells during his trip to the Pacific coast, and is a very remarkable illustration of the rapidity of modern dry plates of the highest grades. Our readers must remember that the scene is reversed in the picture, in the original the rocks are on the right hand side.

GOOD WORDS FOR THE "INTERNATIONAL ANNUAL."

'Tis a beautiful book. I value it very highly. It ars evidence of a kind fellow feeling, that does one good on reading its pages.

Yours truly, S. P. Watt.

I congratulate you on your success in turning out such a beautiful book, as is the Annual for 1891–92. Very truly, Geo. E. Davenport.

I am very much pleased with the "get-up," and have derived much pleasure from its contents. Yours truly, C. D. Habliston.

"It is a dandy." E. F. Bacheller.

This makes the fourth volume of the "International Annual" of Anthony's Photographic Bulletin to be published. Of the several photographic journals Anthony's holds a place particularly high in the estimation of the world's amateurs in the art. Capable writers have filled this "Annual" with such discussions, experiences, explanations and admonitions as camera lovers will value. To what condition of excellence photography has come is practically shown by the illustrations of the book, which are from negatives made by both amateurs and professionals.—*Providence Journal.*

The "International Annual" of Anthony's Photographic Bulletin, the fourth volume, a book of interest and value to all photographers, whether amateur or professional. It contains articles and essays by experts from all over the world upon all conceivable subjects connected with this growing and popular art, and it is most attractively illustrated with examples of photography in all its branches.

Valuable tables and a list of foreign and American societies are also given.—*Hartford Courant.*

This collection of short instructive papers and reproductions of photographs is noteworthy as showing the interest now taken in photography and the advance it is making year by year.—*Baltimore Sun.*

This is a volume that is replete with articles that will engross the attention not only of the professional, but of the amateur photographer, for it is made up of matters that show the progress of the art which so many persons have taken such pleasure in of late years. It is a most instructive work, that can be read with profit. It is illustrated, and the illustrations, which are among the best of the kind, show the advancement that has been made in the development of camera pictures.—*San Francisco Morning Call.*

Any amateur with the camera will be interested in the "International Annual" of Anthony's Photographic Bulletin. This is the fourth volume and it will be found an excellent record of the progress made in the science during the year, with plates that illustrate the new methods in instantaneous photography and the process work. Several of the illustrations are extremely beautiful and show to what perfection the mechanical processes of reproducing the delicacy and finish of the best photographs have been carried.—*San Francisco Chronicle.*

It gets better every year and the illustrations are very good.

Yours truly, Thomas Mansell.

I have had but little time to look at it, but the hasty glance I have been able to give, leads me to pronounce it a fit companion for its three predecessors. In make-up, it is all that could be desired. Very truly yours,

E. F. Wilder.

I find it as usual, full of good things ; I don't see how it could be improved.

Yours truly, Edward Bierstadt.

RAILROAD FARES TO THE CONVENTION.

Buffalo, N. Y., July 14th–17th.

The Erie Railway Company will make a rate of one and one-third fare ($10.67), New York and Buffalo and return, for the above meeting.

Delegates and others can obtain certificates entitling them to the reduced rates on application to E. & H. T. Anthony & Co., No. 591 Broadway, New York, or to J. Buckley, G.E.P.A., Erie Railway, No. 401 Broadway, New York.

If any would like to go with our party to Buffalo over the Erie Railroad and will advise us on or before the 13th of June, we will endeavor to secure sleeping berths for them. E. & H. T. Anthony & Co.

PHOTOGRAPHER'S ASSOCIATION OF AMERICA.

Buffalo, N. Y., July 14–17, 1891.

PROGRAMME.

First Day, Morning Session, 9 a.m.

Calling Convention to order. 1st. Address of welcome by Mr. H. McMichael. 2d. Roll call. 3d. Reading of the minutes of the last meeting. 4th. Report of Standing and other Committees. 5th. Selection of location for the next Convention. 6th. Appointment of Committee on Nominations. 7th. Appointment of Committee on Awards. President's Annual Report.

Second Day, Morning Session, 9 a.m.

1st. Reading of communications. 2d. Report of Committee on Nominations. 3d. Report of Special Committees. 4th. Unfinished business. 5th. New business.

Afternoon Session, 2.30 p.m.

1st. Posing and lighting. 2d. Backgrounds and accessories. 3d. Art Photography. 4th. Orthochromatic photography.

Evening Session, 7.30 p.m.

Art criticism on photography, illustrated by the aid of the stereopticon.

Third Day, Morning Session, 9 a.m.

1st. Reading of communications. 2d. Unfinished business. 3d. New business. 4th. Reports of committees. 5th. Election of officers.

Afternoon Session, 2.30 p.m.

1st. Developing. 2d. Retouching. 3d. Dry plate photography. 4th. Bromide printing.

Evening Session, 7.30 p.m.

Practical flash-light photography.

Demonstrations of several lamps and the merits of the same will be shown by throwing on the screen with the aid of the stereopticon the results of the different exposures.

Fourth Day, Morning Session, 9 a.m.

1st. Reading communications. 2d. Reports of Committees. 3d. Unfinished business. 4th. New business. 5th. Announcement of awards. 6th. Adjournment.

The above is subject to slight changes, and in addition to the above there will be several papers read on different subjects, which will be well worth listening to.

The hotel rates as given to the members of the Association are as follows :

The Iroquois (headquarters), $3 per day and upward.

The Broezel, $3 per day and upward.

The Tiff, $2, $2.50 and $3, in accordance to the room and location.

Two persons in a room, $1.50 per day each, one double bed.

The Genesee, $3 per day and upward.

The Committee on Railroads have secured special rates of one and one-third fare for round trip from all points to Buffalo. Obtain from your railroad ticket agent a return coupon, which when properly signed by the Treasurer (P. A. of A.) at the Convention, will allow a discount on the return trip.

There will be an excursion to Niagara, on Saturday A.M., July 18th, and due notice will be given during the Convention as to the arrangements for the same.

From all sources come the reports that it bids fair to be the most successful Convention yet held.

Fraternally yours,

George H. Hastings,

Prest. P. A. of A.

ANTHONY PRIZES AT THE BUFFALO CONVENTION.

One Hundred Dollars in Prizes for Pictures made on the N. P. A. Albumen Paper.

A Prize of $50 will be given by Messrs. E. & H. T. Anthony & Co. for the best six portraits from life; sizes to be not less than cabinets, and made on the N. P. A. albumen paper.

A prize of $50 will be given by Messrs. E. & H. T. Anthony & Co. for the best six landscapes; sizes not less than 5 x 8 inches, and made on the N. P. A. albumen paper.

A committee of three members of the Association, to be appointed by the President of the P. A. of A. at Buffalo, are to award the prizes.

CRAMER PRIZES.

Three prizes, $100 each, for the three best collections of Portrait work made on Cramer plates.

One prize $100 for the best Landscape work made on Cramer plates.

One prize $100 for the best collection of work, illustrating the rapidity of Cramer plates.

One prize $100 for the best collection of work on Cramer's new Isochromatic plates, showing their advantages over ordinary plates. Each picture to be represented in duplicate, one on an isochromatic and one on an ordinary plate.

All competing exhibits to be framed about 25 x 60 inches, with or without glass, with the photographer's name inscribed or attached thereon. Size and number of pictures in frame unlimited.

The Awarding Committee to be elected by the competitors themselves.

The competing pictures shall be placed in our exhibit and must be shipped in time, charges prepaid, to G. Cramer Dry Plate Works, care of Buffalo Convention.

AIR BRUSH PRIZES.

The Air Brush Manufacturing Company have offered for prizes this year, on the work to be exhibited at Buffalo, one air brush for the best portrait in colors, and one for the best portrait in black and white, to be made with the air brush, over print or sketch. Competition open to all.

ANTHONY'S

Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,

Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,

and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held Wednesday evening, June 10, 1891, the *President*, Mr. JOHN G. BULLOCK, in the chair.

The Board of Directors reported the election of the following active members: Howard Laurence Roberts, Thomas Lynch Montgomery, and Benjamin Sharp. They also announced that a plan was under consideration, details of which would be given later, for a competitive exhibition to be held during the coming fall or winter, of lantern slides from hand-camera negatives representing the summer work of members of the Society.

Mr. J. F. SACHSE read a paper on "The Preliminary, Secondary, and Supplemental Lighting of the Photographic Plates." (See page 392.)

At the conclusion of the reading, Mr. Carbutt inquired on what date the first colored diaphragm was used in the lens.

Mr. SACHSE said he did not know the date, but it was first used by Guillard.

Mr. CARBUTT stated that he had used a colored diaphragm in 1858 or 1859. He was then working in a small gallery in a small way, in an interior town in Indiana. They were using the wet collodion process at that time. He used a blue diaphragm, and obtained a sharp picture in about the same time that would have been required by a very much larger aperture.

Mr. BELL said that in 1872 the photographer of the Treasury Department and himself instituted a series of experiments in preliminary lighting. The plate was exposed from three to five seconds with a red glass in front of the lens, and then exposed on the sitter. The result in all cases was less valuable than if they had not exposed to the red light at all, but had given it proper time. It might be useful where a man's chemicals were in a very insensitive condition, as it would help him to make a much better picture than he could otherwise obtain. He had also used the blue light, by apertures in front of the box, and again in the cap, and after exposure swung in front of a white screen for an instant. At that time he had slow light, and this method helped him very much to get certain pictures, such as children. Still, the results were never very good—not as perfect as would have been the case had he been able to expose the proper time.

The *Chairman* inquired which color gave the best results, the blue or the red?

Mr. BELL replied that in the preliminary lighting he found the red glass was the best.

Mr. CHEYNEY said that it seemed to him they all used the preliminary, etc., lighting. While it was not intentional, they all did exactly what Mr. Sachse had described. In the first place, they took out their plates in a dark room lighted by red light, dusted them, and inserted them in the holders. That was the preliminary lighting. Then they exposed the plates. That was the secondary stage. Next they developed under the red light, and if the development did not proceed fast enough they held the plate up close to the red light to see what was the matter. That was the supplemental lighting. Hence, they all did what Mr. Sachse had described.

In reply to a question from the *Chairman*, Mr. Sachse said the red light employed was merely the ordinary red light of the lantern.

The *Chairman* asked where, then, lay the difference between this red light and that used in ordinary development.

Mr. SACHSE stated that it differed in this respect, that he personally always filled his holders in the dark. Then, after exposure, he never subjected the plates directly to the red light of the developing room, but put

them in the pan in the shadow, and, after a few minutes, held them to the red light to see if the image had appeared. He was always very careful to keep away where the exposure was normal.

Mr. McCollin said he recollected one of the members, Mr. Browne, in the old collodion-emulsion days, brought to him some undeveloped plates; and they were made into fairly good plates by means of candle-light. They were developed in a yellow glass dish.

Mr. Cheyney explained the test he made of his lantern. He exposed a 26 Seeds plate before the lantern for five minutes with a figure cut from cardboard in front of it, and could get no image—the plate was perfectly clear. So he came to the conclusion that he was quite safe in taking his time in development.

Mr. Sachse remarked that he found a difference in the makes of plates. In one make of plates exposure to the lantern invariably resulted in fog. Two other makes he was in the habit of using always came out clear.

The *Secretary* inquired if this was really an improvement, or only a slight veiling which, as Mr. Carbutt said, made certain details apparent or softened down the hardness of an under-exposed plate.

Mr. Sachse's experience has been that it did bring out detail. In speaking of the matter three years ago with a professional photographer, that gentleman attributed the improvement to pouring off the developer and leaving the plate exposed to the action of the air. He contended the ruby light had nothing to do with it, and said that when he found under-exposed plates he poured off the developer, exposed to the air, and then put them in the developer again.

The *Secretary* said it seemed to him that plates grew in detail while being examined, as though the air, coming in contact with the plate, might have that effect.

Mr. Walmsley supposed every one working with a developer had experienced that. His own developer he kept on the plate only long enough to bring out the detail slightly; he then poured it off, put a cover over it, and it would bring out a density in a few minutes so dark that they could not see through it.

Mr. Ives stated that more density would be developed where the air came in contact with the plate than where it was kept from it.

Mr. Cheyney mentioned an instance where he had allowed the negative to rest on the edge of the dish, and the part exposed to the air was better developed than the portion immersed in the developer. In fixing, also, he had found that where the process was slow it was quickened by taking the plate out and letting it stand on edge a little while before returning it to the bath. There seemed to be some oxidizing action of the air that helped development and fixing along.

Mr. Fox said that in the collodion-emulsion days, when they worked with yellow light, it was a common dodge to pour the developer off the plate and let it stand for some time. The negative would come up very well in that way; it brought the detail out rapidly.

Mr. Stirling said it had been suggested that part of the action or the benefit brought about by breathing on the plate was due to the added heat; but he wished to ask for some information. What Mr. Cheyney had said about his developing lamp was at variance with his experience. He had never handled any plate that he could expose within five inches of any lamp he had ever seen without developing fog. He thought it would be interesting to all present if Mr. Cheyney would tell what lamp and what colored medium be used.

Mr. Cheyney stated that his lamp was a Carbutt's *Multum in Parvo*. It had a face of ruby-colored, hammered glass in front of it. This he had the misfortune to break, so he took two pieces of Carbutt's yellow paper and pasted a piece on one side and one on the other, and he could stand a Seeds 26 plate in front of it with a figure against it, for five minutes, and nothing but clear glass could be gotten out of it.

Responding to a remark from Mr. Stirling, Mr. Cheyney said he was never more than eighteen inches or two feet away from the lantern, and he could see the details come up, and he had not very good eyes.

Mr. Stirling hinted that as Mr. Cheyney wore glasses he could probably see better than he (Mr. Stirling) could.

This Mr. Cheyney denied, and continuing, said that when he desired to tell the density he always examined the plate by the clear, red glass in the door of the lantern.

Mr. Bell spoke in favor of the sodium core, or "Aladdin" lamp used by Mr. Rau. He advocated plenty of light in order to distinguish the density of the plate.

Mr. Rau, in answer to a question, said the sodium core gave a very pale orange light.

Mr. Sachse inquired whether any of the members present had ever had experience with the white or colored camera interior.

Mr. Bell said that in the old daguerrotype

times they had used something like that, but it was abandoned, mostly for the reasons given in Mr. Sachse's paper. The images obtained were very indifferent.

Mr. Ives thought it would be of interest to the members to know that in the old wet-plate days a secret method was sold to photographers, for $10, which consisted of a lighted wax match, to be held until burned out—a very convenient way for supplemental lighting.

Adjourned.

Robert S. Redfield,
Secretary.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

The last regular meeting for this season of the above Society was held on the evening of June 9th, President Stebbins occupying the chair. The regular routine was dispensed with, the first business being the exhibition of new apparatus. The first item under this head was Quartley's Bromide Enlarging Cabinet, an instrument occupying but some three feet of space and working to all sizes from 10 x 12 to 18 x 22. Two cameras, of the hand camera type, were also shown, one being the Premier, made by the Rochester Optical Company, and the other, the Hetherington Magazine camera. Both of these cameras have many points to recommend them, and show what a large amount of ingenuity is being expended to meet the requirements of the photographer.

The chief business of the evening was an informal talk, by Mr. Murray, on Lenses, Diaphragms, Angle of View, etc., special reference being made to the use of the lens in hand cameras. Speaking of the angle of view, Mr. Murray said much ignorance prevailed. He recommended his hearers to peruse the Table of View angles, compiled by Dr. Woodman, and printed in the "International Annual." Dividing the base of the plate by the equivalent focus of the lens, reference to the aforesaid table would give the angle embraced. Mr. Murray then carried his discourse on to the shapes of lenses, describing the single lens, the rapid rectilinear and the wide angle. Chromatic and spherical aberration were discussed and the methods of obviating these demonstrated upon the blackboard. The meanings of the numbers on the stops and the method of obtaining the same were dealt with, and what had hitherto been Greek to many was lucidly explained and made simple by Mr. Murray. With a few remarks upon depth of focus the talk ended for that evening, to be concluded at a meeting to be specially convened by the President.

A vote of thanks was accorded Mr. Murray for his instructive and interesting lecture.

Mr. Fowler, of the Brooklyn Academy of Photography, read a paper, written by Mr. La Manna, on the recent work of Professor Lippmann, of Paris, and exhibited a plate specially prepared for exhibition at the recent Photographic Conference held in New York. In the production of this particular plate, a beam of light from an arc of twenty-five amperes was passed successively through a condenser, water bath, prism and lens, and then focused upon the ground glass. This latter was then replaced by a collodion albumen plate which was quite uniform and free from any granularity. The plate was placed against a U-shaped piece of rubber, film side inwards, a glass on the other side completing the formation of a small bath which was filled with mercury. After an exposure of three minutes, the plate was developed in pyro, fixed in hypo, and well washed. No colors appeared until the plate was dry, and the completed picture was the plate presented for inspection. Professor Lippmann's explanation of the phenomenon on the principle of interference was then given. The colors are not pigments but are analogous to the colors of the soap bubble or of mother of pearl.

The plate exhibited showed a perfect spectrum in brilliant, intense colors by reflected light, and was simply marvelous. By transmitted light, but little, if any, coloration was visible. The plate was examined with much interest and excited considerable comment and admiration.

A vote of thanks to Mr. Fowler brought the meeting to a close.

YONKERS PHOTOGRAPHIC CLUB.

On Monday evening, June 8th, Judge Canfield, Newcomb and Tyler carefully inspected the 379 prints in the Photographic Club's exhibition at Hawthorne Hall, the prize-winning photographs wearing the ribbons of honor —a yellow ribbon to first, a white ribbon to second, and a blue ribbon indicating a special prize for pictures entirely the work of contributors. The negatives of all pictures in the exhibition, however, were required to be taken and developed by the contributors alone. The following pictures take the prizes to be awarded :

First and Second Prizes.

Class A, landscapes—1. "The Brook," 165, by Eugene D. Gardner. 2. "An Adirondack Landscape," 157, by same artist.

Class B, landscape with figures—1. "The Harvest," 8, by John W. Alexander. 2. "Spring Furrows," 213, by George B. Ritter.

Class C, animals—1. "Astray," 27, by Walter Blackburn. 2. "Almost Milking Time," 194, by Harry J. Oakley.

Class D, marines—1. "On the Sound," 46, by Walter Blackburn. 2. "Sunlight on the Sea," 232, by George J. Stengel.

Class E, genre—1. "Mr. Hayseed in Politics," 142, by F. W. R. Eschmann. 2. "Now I Lay Me Down to Sleep," 11, by John W. Alexander.

Class F, portraits—1. Portrait No. 2, 22 in catalogue, by John W. Alexander. 2. Not awarded.

Class G, interiors—1. "The Stairway," 239, by George J. Stengel. 2. "St. John's Church," 220, by George B. Ritter.

Class H, still life—1. "A Study," 248, by George J. Stengel. 2. "Lilacs," 222, by George B. Ritter.

Class I, hand camera work—1. "Breezy Day," 365, by George B. Wray. 2. Not awarded.

Special Prizes.

Class A—"An Old Landmark," 163, by Eugene D. Gardner.

Class B—"Sunday Afternoon," 325, by William H. Ulrich.

Class E—"I's Happy," 177, by Eugene D. Gardner.

Class G—"Fireplace in the Hall," 179, by Eugene D. Gardner.

Class H—"An Effect of Light and Shade," 242, by George J. Stengel.

Summary—Gardner, 4 firsts and 1 second; Stengel, 3 firsts and 1 second; Alexander, 2 firsts and 1 second; Blackburn, 2 firsts; Ritter, 3 seconds; Eschmann, Wray and Ulrich, each 1 first; Oakley, 1 second.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

The annual meeting of the above mentioned Society was held at the rooms of the Geographical Society of Japan, Nishikonya-cho, Tokyo, on Friday, May 29th, at 5 P.M.

Mr. Ishikawa, having announced that he had received a note from Viscount Okabe, Vice-President of the Society, who had been asked to preside, to the effect that he would not be able to attend, Mr. Edmond R. Holmes took the chair.

The following report of the secretaries, for the past year, was read:

Like the last year's report, the present one need be but short, as there is little to record save the successful working of the Society for another year. The membership of the Society now exceeds a hundred. Since the last annual meeting, there have been only four ordinary meetings, but there have also been two exhibitions of photographs. One was held in Tokyo in the autumn of last year, the exhibits consisting of the photographs done by members during the vacation. The other was held in Yokohama quite recently, the object being the exhibition of the results of work done on bromide paper that had been presented to the Society by Mr. S. Cocking, and also to award prizes kindly offered by Mr. Cocking to the exhibitors of the three best pictures. Both exhibitions were highly successful. Besides these there were several out-door meetings, that afforded great pleasure to those who attended. It is to be regretted that the attendance at out-door meetings is not larger.

The following processes have been described or demonstrated at different times since we presented you with last year's report: The development of bromide prints, Husband's photo-lithographic process, the carbon process, the gelatino-chloride printing process, the renovating of spoiled eikonogen, flash light photography, and a new silver-printing process.

As regards the number of membership, attendance of meetings, and work done, we venture to pronounce the Society a success, but we still have to regret that the Society does not receive more support than it does from the profession generally.

Mr. J. Johnstone, of Yokohama, expressed some time ago his wish to resign his position as member of committee, as he found that he had not sufficient leisure to attend to the business of the Society. It was thought best, however, that he should remain on the list of members of committee till the present annual meeting.

Dr. W. S. Bigelow, having no present intention of returning to Japan, naturally ceases to be a Vice-President of the Society.

The following balance-sheet was read by the treasurers, who pointed out that it indicated a decided advance in the prosperity of the Society:

Balance-sheet of the Photographic Society of Japan for the Year 1891.

Cash Account.

To entrance fees and subscriptions from 54 members		$175.000
" Balance from 1890		23.585
		$198.585
By Expenses, annual meeting, 1890		$20.000
" Rent of room for meeting and refreshments, 1891		51.250
" Printing expenses—		
Japanese	$28.30	
Foreign	3.50	31.800
" Stationery and postage—		
Japanese	11.15	
Foreign	6.83	17.980
" Flags used at meeting		7.000
" Balance in favor of Society		70.555
		$198.585

Assets.

Subscriptions and entrance fees unpaid—		
1890, Japanese	$24.000	
1890, Foreigners	21.000	
1891, Japanese	36.000	
1891, Foreigners	28.000	$109.000
Property of the Society		10.800
Post cards on hand		.750
Balance in cash		70.555
		$191.105

Liabilities.

Rent and expenses annual meeting 1891 (about)	$ 26.000
Balance in favor of Society	155.105
	$181.105

The election of officers for the ensuing year was then proceeded with.

With the exception of Dr. W. S. Bigelow, Vice-President, who has left the country, and Mr. J. Johnstone, Member of Committee, who resigned some time ago on account of his not having time to attend to the work of the Society, all the Officers of last year were unanimously re-elected.

Proposed by Mr. W. K. Burton, seconded by Mr. E. P. Pallister, Mr. J. B. Rentiers was elected a Member of Committee.

Proposed by Mr. Burton, seconded by Mr. A. J. Hare, Mr. C. D. West was elected a Vice-President.

Proposed by Mr. I. Ishikawa, seconded by Mr. Hare, Mr. Y. Ishidzu was elected a Member of Committee.

A large number of samples of their manufactures that had been presented to the Society by the Fry Manufacturing Company of London were distributed amongst the members present. Some excellent work, in the way of bromide prints and opals, done on certain of the samples by Mr. S. Kajima, were also shown. Mr. C. D. West had tried the plates and had found them of very high quality. Mr. W. K. Burton showed some platinotype prints. These, he explained, had been done on paper that had been kept for more than a year, and that gave nothing but deep fog worked in the usual way. Excellent results had, however, been got by printing very deeply, then developing with a cold solution made up as follows: A 5 per cent. solution of washing soda, 20 ounces; a saturated solution of bromine, in water, 50 minims. He did not remember who had first suggested the use of soda as a developer for platinotype prints. The bromine had been suggested by Dr. E. Divers, F.R.S. It formed hypobromite of sodium with the soda solution, and this was a powerful restrainer of fog in platinotype work.

Mr. K. Arito showed some prints on drawing paper that were of a remarkably fine black tone. They had been prepared by the following formulas:

Salting Solution.

Chloride of ammonium	50 grains
Gelatine	100 "
Water	10 ounces

This was warmed, and 2 ounces of negative varnish were added.

Sensitizing Solution.

Nitrate of silver	2 ounces
Water	10 "

Toning Solution.

Chloroplatinite of potassium	15 grains
Citric acid	50 "
Water	25 ounces

Fixing Solution.

Hyposulphite of soda	2 ounces
Water	10 "

The meeting ended with a vote of thanks to the officers for their labors during the past year, and to the Chairman of the meeting just finished.

After this there was a conversazione.

AUCKLAND (NEW ZEALAND) PHOTOGRAPHIC CLUB.

THE Auckland Photographic Club held its first annual exhibition at the Auckland Institute Buildings, Princes street, on the 3d of April last.

The Governor, who is the president of the club, opened the exhibition with an address, alluding to himself as one of the "shot" class of photographers whose only aim was to carry away some sort of a picture of any passing scene. However, to the credit of the "artistic" class, he would say he had seldom seen anything to equal some of the photographs produced in that part of the world, and he saw no reason why New Zealand, and especially Auckland, should not have a place in the forefront of photographic art.

The vice-regal party, consisting of the Countess of Onslow, Miss Gardiner, Captain Guthrie, Admiral Lord Charles Scott, and Flag-Lieutenant Fitzgerald, were conducted through the exhibition by Mr. Josiah Martin, F.G.S.

In the evening a lantern exhibition with an explanatory lecture was given by Messrs. Martin and W. Morton, using an apparatus invented by the latter gentleman. Among the views shown were some of the Waitomo caves, lent by Messrs. T. Humphries and J. R. Hanna, together with some miscellaneous pictures by Mr. Martin.

The exhibition continued through Saturday, Monday and Tuesday, with an excellent attendance despite the inclemency of the weather.

EXHIBITS.

The Governor's (Lord Onslow) exhibit filled three frames. One of an old church surrounded by elm trees was particularly noticeable as a realistic winter landscape. Another frame contained pictures of the different Government houses of the colony at Auckland, Wellington, Lowry Bay and the residence fitted up for the Governor at Dunedin during the exhibition. There were also some characteristic "bits" of bush scenery. All were clear in outline and excellent in tone, and in no case was appropriate artistic treatment sacrificed to mere technical excellence. Captain Castle, of H. M. S. *Rapid*, gave his ship in dock, a lady in repose and a group of horses, together with five albums of photographic views, illustrating Samoan, Tougan and Solomon Island scenery, interspersed with native portraits. These were constantly in requisition, especially by the lady visitors by whom they were very much admired.

Mr. J. R. Hanna (one of the Vice-Presidents) exhibited some splendid bromide enlargements, portraits of Sir George Grey, the Mayor and Professor Archibald, Mr. Carrington and his baby, little Lord Fauntleroy and a lady, all of which bear the handmarks of his excellent studio work.

Dr. J. Logan Campbell showed a frame of sunrise and sunset effects. The special knowledge required for the production of this class of work is possessed by no other local amateur, aud the collection is well worthy of study and inspection.

Silver prints by Mr. Charles Hemus of Lady Onslow and Lady Charles Scott, are grand portraits, the pose of the former being especially noticeable. Another frame of cabinet portraits fully sustains his high reputation.

Mr. A. J. Hunter, Secretary of the Club, exhibited four bromide enlargements, portraits, together with a series of photographs ot the Waitomo caves.

Mr. Josiah Martin (one of the Vice-Presidents) had four frames containing some really fine views of the Geysers of Whakarewarewa; also a series of geysers, craters, volcanoes and boiling pools. One photograph of the Perata exhibits the tossing of its black contents under a dense canopy of steam. Another frame represents some of the Wairakei wonders. He also exhibited a group of the officers of Lodge Prince of Wales, and a portrait of his little daughter.

Mr. J. C. Morton exhibited some remarkably good enlargements, also some stereo views of local scenery, including two moonlight effects on the Waitemata.

Mr. H. Schmidt showed some fine "shutter-work" in his Maori war canoe race at the Jubilee Regatta.

A splendid collection by the late Mr. G. D. Valentine, comprising the Lake Country, Samoa, Raratonga and Tahiti makes us doubly regret our loss.

Mr. Gregory exhibited a bromide enlargement of a lady and some cabinet portraits.

The New Zealand *Herald* exhibited four frames of reproductions by the ink-photo process from negatives by Messrs. Josiah Martin, the late G. D. Valentine and F. W. Edwards.

Pulman (Mrs. Blackman) showed a unique collection of Maori heads, especially valuable as studies. The technique was distinctly good.

Mr. Partington sent a case of portraits and

two bromide enlargements of a little girl and a young man.

Mr. F. Will exhibited some well handled architectural subjects of churches, hotels and public buildings.

Mr. H. Utting exhibited some photographs of New Zealand bush which showed both care and ability.

Mr. H. Carson showed a bromide enlargement of an artist's studio.

Mr. S. C. Brown (the Mayor of Newton) exhibited some local scenery and harbor views.

A collection of bromide prints, made by the late Mr. J. P. E. Frame, of views on the Nikotupu, attracted much attention.

Some bromide enlargements of children blowing soap bubbles were shown by Mr. Andrew.

Mr. Thomas Humphries, Commissioner of Crown Lands, contributed some bromide prints of Mount Egmont, and the white cliffs, Taranaki.

Two subject pictures, "Hope" and "Contentment," by Mr. H. B. Morton, hardly needed their titles below, so well were the impressions conveyed.

A shutter picture of the whaleboat *Race;* a view of the H. M. S. *Orlando* in dock, were excellent samples of Mr. Theo. Fair's work.

Mr. A. G. Tibbutt (New Zealand *Herald)* contributed a view of old St. Benedict, one of Albert Park, and a colored photograph of a Maori woman, together with some others equally good.

Mr. G. R. Bolton showed a bromide enlargement, and a specially delicate print of Lake Lotorna.

Home portraiture was successfully vindicated by Mr. H. G. Churchward in his speaking likeness of the club's genial Treasurer.

Mr. L. B. Walrond exhibited two bromide enlargements, "Sympathy," and a view on the Waipato River.

Mr. R. L. Caldwell exhibited himself taking a picture; a successful combination.

Mr. Park loaned some bromide enlargements of bush scenery.

Mr. Pegler showed three frames of silver prints remarkable for their depth and tone.

Mr. B. Meyers exhibited four small but promising frames.

Mr. Smith, of the Kauri Timber Company, showed some "careful" photographs.

A specimen of crystoleum work by Mr. William Fenton was creditable.

American work was ably represented by Mr. Graves Aicken, in five views of Niagara Falls.

Messrs. Wildman and Lyell placed on the table several numbers of "Sun Artists," and Mr. Hanna a journal entitled, "Our Celebrities," Mr. Chapman loaned a number of whole plate views of Scotland scenery, Mr. Engster kindly loaned four stereoscopes and accompanying views.

Ten photo-mechanical productions of Dr. P. H. Emerson's work adorned the end of the room over the dais.

Messrs. Murray and Spencer exhibited some specimens of their photo-mechanical work.

Messrs. Crawford and Stewart had also a number of exhibits.

The lime-light exhibitions were as usual the most popular feature, and their success was largely due to the efforts of Mr. J. R. Hanna, who presided at the lantern, and the excellent quality of the slides furnished by Captain Sinclair and Mrs. Broomhall.

Mr. Josiah Martin, in a closing address, expressed the thanks of the club to the Council of the Institute for the privilege of holding the exhibition in the museum, and expressed the hope that both amateurs and professionals would be equally benefited by the combination of their exhibits, and that the social reunion would materially assist the development of photography at Auckland. Mr. Martin also made some timely remarks on the death of the late Secretary, Mr. Francis, and the loss that the Club had sustained in his demise.

The success of the exhibition, he said, was in a great measure due to Messrs. Carson, Ashley, Hunter, Boulton and Caldwell.

The committee also thanked Mr. Morton for the loan of his lantern and kindness in operating it each evening.

A fitting close was the vote of thanks unanimously expressed by the audience.

AMERICAN PHOTOGRAPHIC CONFERENCE.

(*Continued.*)

Dr. Ely Van de Warker, the President of the Conference, responded to Mr. Poey's welcoming speech in a few choice remarks. He satisfied all, that the delegates appreciated the efforts of the Brooklyn photographers, and on behalf of his fellow visitors, thanked them for their kind reception.

Mr. William C. Beecher next came upon

the stage and proceeded to explain the pictures which a large lantern was beginning to throw upon the screen. Mr. Beecher seemed to be in a happy frame of mind, for every view appeared to be sufficiently inspiring to call forth a bright witticism from him or some facetious remark. In all, 161 views were given, and they embraced landscape and marine scenes, pictures of the city, the town and the country; in fact, anything and everything that the snap-shooter has thought worthy of his ability. Mr. Frank La Manna's foreign scenes and many others excited favorable comment and proved interesting and attractive to the onlookers. The pictures were all choice, having been selected from about 500 specimens submitted, and there was not a single one that could reflect anything else than credit upon its artist. The affair was managed by Harry S. Fowler, Frederick M. Lawrence and Starks W. Lewis.

COUNCIL MEETING, 9 A.M., MAY 28, 1891.

The minutes of the Council Meeting of May 28th were read and approved. The resignation of Prof. Edward Weston (Newark Camera Club), as a member of the Council was presented and accepted. Mr. W. A. Halsey (Newark Camera Club), was unanimously nominated to fill the vacancy.

The President announced his appointment of the following committees: Foreign Relations, Custom House Privileges and Badges, Oscar S. Teale (President Plainfield Camera Club); Miss Frances B. Johnston (Washington Camera Club); H. S. Fowler (Brooklyn Academy of Photography).

Papers and Conference Standards—C. R. Pancoast (President Photo Society of Waterbury); Randall Spaulding (President Postal Photo Club); W. A. Halsey (Newark Camera Club); Dr. Ely Van de Warker (Syracuse Camera Club); George Bullock (Cincinnati Camera Club).

Exhibition Committee—T. J. Burton (Society of Amateur Photographers of New York); W. H. Drew (President Lynn Camera Club; Dr. George L. Parmele (President Camera Club of Hartford); Miss Frances B. Johnston (Washington Camera Club); H. S. Fowler (Brooklyn Academy of Photography).

Membership Committee—J. W. Alexander (President Yonkers Photographic Club); W. A. Halsey (Newark Camera Club); A. J. Thomas (President Hoboken Camera Club).

Conference Lantern Slide Interchange Committee—Dr. Ely Van de Warker (Syracuse Camera Club); Paul Thiery (Newark Camera Club); Cornelius Van Brunt (Photo Section, American Institute).

Mr. Bullock moved that the following rules govern the admission of slides to the interchange, which was adopted.

SIZES, MATS AND LABELS.

"Slides for submission to the interchange shall not vary more than one-sixteenth of an inch from the standard size of 3¼ inches in height by 4 inches in length, the picture being perpendicular to the 4-inch side of the plate.

"The diagonal of the mat opening shall not exceed 4⅛ inches, and the subject shall be centred on the plate.

"Slides shall be marked as follows: The subject-name shall be placed on the right-hand end of the picture as you look at the positive in its proper position, and a thumb label containing the invoice number on the lower left-hand corner of the same.

SLIDES AND NEGATIVES.

"The negatives from which slides are made must be the work unassisted of the member submitting the same, and when the slide is not all the member's work it must be so stated."

The President appointed T. J. Burton, Editor, and Miss Frances B. Johnston, as Assistant Editor of the *Monthly Journal*.

It was voted to recommend to the Conference for honorary membership the names of Prof. G. Lippmann, of the Academy of Sciences of France, and Dr. R. L. Maddox, of England, the originator of the dry plate. Council adjourned subject to the call of the chair.

CONFERENCE MEETING, 10 A.M.,
Thursday, May 28, 1891.

President Van de Warker presided. The Secretary reported that the Council had decided to recommend that the next annual meeting of the Conference be held in New York in the last week in May, 1892.

The Conference ratified the above report.

The various committees as appointed were also announced.

The Conference listened to a short paper entitled, "Photography as an aid to the Study ot Natural History" written by Prof. Charles Dury and read in his absence by Mr. W. H. Drew. A paper written by Mr. Frank H. La Manna on "Prof. Lippmann's Discovery of Photographing the Spectrum Colors" was read by Mr. H. S. Fowler. A slide was exhibited made from one of the negatives of the spectrum in colors taken by Prof. Lippmann. Dr. Mercer made a short address on the above subject. The Council recommended the names of Prof. Lippman and Dr. R. L. Maddox for honorary membership. The recommendation was unanimously adopted. Mr. C. Gentile, delegate from the Chicago Camera Club and Photographic Society of Chicago, moved that a special committee be

appointed to confer with the World's Fair Committee with a view to having photography classified at the coming World's Fair. Carried.

The Chair appointed as the Committee, C. Gentile, the President of the Chicago Camera Club, the President of the Photographic Society of Chicago, Miss Frances B. Johnston and Dr. Ely Van de Warker.

Mr. Oscar S. Teale (President Plainfield Camera Club) presented an excellent paper entitled, "Stereoscopic Effects with the Optical Lantern." A discussion followed. A hearty vote of thanks was tendered to the Society of Amateur Photographers of New York, and to the Brooklyn Academy of Photography for the courtesy and hospitality exhibited toward the delegates on the occasion of the excursion and the exhibition. President Van de Warker delivered a short closing address reviewing the work accomplished during the sessions of the Conference, and expressing the hope that all the delegates would be able to be present at next year's Conference.

FIRST ANNUAL DINNER.

The first annual dinner of the American Photographic Conference was given at Clark's on Thursday evening, May 28th. About fifty delegates were present and discussed an excellent menu. President Van de Warker presided and after the cigars were lighted called upon Prof. Charles Ehrmann. Prof. Ehrmann responded in an excellent speech. He said he hoped that the Americans would shortly lead the world in photography. He criticised very severely the awards made by the judges at the Joint Exhibition. Among the other speakers, were Prof. Laudy of Columbia College, Wallace Good Levison, Gonzalo Poey, Prof. Randall Spaulding, Alexander Beckers, Dr. M. B Feeney, W. H. Drew, C. W. Canfield, C. Gentile and others. The evening wound up with some excellent music, recitations and humorous stories. A vote of thanks was tendered to the dinner committee for their excellent arrangements. A feature of the occasion was a beautiful menu card designed by Mr. C. H. Davis.

The entire company joined hands, and sang "Auld Lang Syne." The following gentlemen composed the dinner committee: T. J. Burton, F. C. Beach, Edward Weston, A. J. Thomas, Randall Spaulding, H. S. Fowler, Cornelius Van Brunt, J. W. Alexander.

T. J. BURTON,
Secretary.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—B. C. T. writes: Will you kindly inform me how much sulphuret of potassium I am to use to precipitate the silver in any hypo-waste, from prints as well as plates? How am I to know when I have gotten in enough? As long as I pour the sulphuret of potassium into the hypo-waste a deposit, precipitate, or curdle forms? How I am to know when I get enough in?

A.—Allow the precipitate to settle and pour off some of the clear fluid into a graduate. To this add some more of the solution of potassium sulphuret, and if a precipitate forms in the clear fluid more of the sulphuret is needed in the bulk of the hypo-waste. If, on the other hand, no precipitate forms in the graduate no more is necessary in the bath. You must add the sulphuret till it will not give any more precipitate.

Q.—G. B. S. writes: Will you be kind enough to tell me how to get rid of blisters on albumen paper? I send you a sample of my trouble.

A.—Use a salt bath before you begin fixing; about a tablespoonful of salt in a quart of water will generally do, and do not use a hypo bath stronger than 1 in 10, and as cool as possible.

Q.—D. M. writes: Will you please inform me how to remove spots on dry plates that form after they have been kept for some time?

A.—We cannot help you unless you tell us more about the character of the spots you mean. Send us a piece of the plate that shows these spots and we will examine it.

Q.—J. R. M. writes: Please inform me through columns of BULLETIN the easiest method of printing in black lines direct from India ink drawings on tracing cloth. I want to print some maps of city and do not like the blue print well enough?

A.—There is a paper in the market that is prepared with a mixture of persulphate and protosulphate of iron that works very nicely and is developed with pure gallic acid, giving black lines on a white ground. We presume our publishers could supply you with it; write to them direct.

Q.—F. J. W. writes: We are having trouble with our silver bath on the albu men paper. The toning is very slow, the tones are brick-red, and there are plenty of blisters. The silver bath is clear and clean, with fifty grains to the ounce. Will you also tell how to treat a silver bath that has been boiled to dryness and fused? Is the silver in it affected?

A.—The red tones are probably due to insufficient silvering. Float the paper on the silver bath for two minutes and fume for twenty or thirty minutes. The fused bath should be dissolved in the least quantity of

pure nitric acid, then diluted with water till it is the proper strength and finally neutralized with ammonia until just alkaline to red litmus paper. Now add enough pure nitric acid to make it turn blue litmus paper just red. Allow to stand and pour off, or filter the bath, and it is fit for use. Boiling down and fusing does not harm the silver if it is treated as above, and the silver nitrate used originally was pure.

Q.—K. W. writes: Can you give me any other formula for a platinum toning process than the one published in Anthony's Series, No. 29, page 28. I would like to tone a number of prints at a time to black color.

A.—We do not know of a better platinum toning bath than the one given by the authority you quote, but we suspect that you may have used the bichloride of platinum instead of the chloroplatinite of potassium. It is absolutely necessary to have the correct salt to obtain good results. A formula that has been lately recommended as very good is to be found on page 292 of the BULLETIN of May 23, 1891. Try it, to us it appears to be good.

Views Caught with the Drop Shutter.

WE regret to hear that the beautiful home of Mr. G. H. HASTINGS, at Newton, near Boston, was lately damaged by fire. Fortunately no one was hurt and the damage was slight. We congratulate Mr. Hastings on his escape from more serious results.

THE HAMMER ALTHANS MANUFACTURING COMPANY have just completed their handsome factory at St. Louis for the production of dry plates. The main building is 170 feet long by 57 feet wide, with three floors that contain about 20,000 square feet. We are pleased to note this progress and hope for great developments in the near future.

THE BAUSCH AND LOMB OPTICAL COMPANY write us about their Prize Lens Competition as follows: In the prize contest inaugurated by us, we have received, from forty of the most prosperous amateur societies, responses expressing their willingness to participate in this contest, and from nearly each one we learn that the matter is being taken up with much interest and enthusiasm by individual members, and we are complimented on inaugurating this contest, which, as some have expressed, is creditable in enabling each participant to become familiar with the American product in the way of lens and shutter. The success of this movement is absolutely assured. The lenses and shutters with which the competing negatives are to be made have been sent to every society that has entered the contest and the matter is now fairly under way.

Mr. E. J. PARTRIDGE, of Portland, O., died June 30th last, in San Francisco, after a lingering illness of several months from Bright's disease. For a number of years past he was the proprietor of the photographic supply house in Portland, O., and eight years ago he was in company with his brother in Boston. Under the provisions of his will the California business will be continued. We tender our sincere sympathies to all his sorrowing friends.

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ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. JULY 25, 1891. No. 14.

THE BUFFALO CONVENTION.

THE Convention of the Photographer's Association of America met in Buffalo during the week ending July 18th. As a Convention it was fully up to any of those held in the East. In the papers read before the members the practical side of the art was thoroughly discussed. About five hundred members were present and much pleasure and profit must result from their coming together even for a few days.

The choice of location was a happy one in many ways. The buildings were amply commodious, nicely lighted, and what is very important in hot weather, were well ventilated. The only cause for regret was the distance from the city of Buffalo proper. But even this was in a measure compensated for by the beauty of the route through which the horse-cars ran to reach the exhibition grounds. The environs of Buffalo are noted for the fine residences of its citizens ranged on streets and avenues covered with concrete that makes travel a pleasure. With the exception of the first day the weather was delightful.

The evening sessions were held in the hall of the Academy of Music, a variation in the usual programme that was exceedingly pleasant, in that it took the members away from the bustle and noise that are always an association of the day sessions. These evening meetings are becoming an institution with the association and we are glad to see it. The BULLETIN suggested this several years ago, and every time it has been done it has been a source of comfort to those members who like to hear the papers and discussions, without the din and distraction that has often been the accompaniment in times past. This is one of the many ways in which the Conventions of the Photographers' Association of America have shown a steady improvement and the result of experience in those who are guiding its destiny to yet higher levels of usefulness in the future.

The Daguerre memorial fund received another handsome addition in the form of five hundred dollars, contributed by the attending members, and while subscriptions are still in order the debt to the sculptor will now be paid without

delay. If any of our readers have yet delayed sending their subscriptions to this fund, they should do so at once, for there is no doubt that the time will come when they will either regret they did not, or be proud that they had an interest in honoring the French scene-painter, who gave the world a new art that has been a means of beautifying our homes, leaving with millions impressions of our dear ones, that before its advent could only be obtained by the rich in the land. Daguerre was the first to give us a practical method of making portraits that came within reach of the purses of the people, and the monument erected to his memory in the Smithsonian Institution at Washington is one that every photographer should take a pride in. If it is only a single dollar that you send, do it now, and your interest will be just as strong as the one that sent a hundred times as much; you did what you could.

In our wish that every photographer in America should have an interest in the Daguerre monument, we have diverged from our account of the Buffalo Convention. But our readers will forgive us, the cause is a good one.

The programme arranged by the Executive Committee was carried out in good form. The presiding officer, Mr. G. H. Hastings, deserves great praise for the earnest manner in which he worked for the good of the Convention.

We must not forget also the arduous labors of Messrs. Stein and Stuber. These gentlemen worked long and late to get the art exhibits in place in time. They were greatly handicapped by the tardiness of many of the exhibitors, who had not shipped their exhibits in time. It is a great mistake to impose upon the good nature of the officers of the Association in this manner. It takes a good deal of enthusiasm out of the work when the executive officers are at their posts two days ahead of time, and are compelled to be idle in consequence of the non-arrival of the exhibits, and finally have to work into the small hours of the night to complete their task in time. With a little forethought this might be avoided. Nevertheless, their patience and energy had its reward in the praises of those who admired their fairness and impartiality, in the treatment of those who were competing in the various classes.

The exhibits of apparatus and those outside the competing exhibits, occupied a floor space of 25,000 square feet. These displays were a source of much interest, and we shall have more to say about them on another occasion.

The Buffalo Convention will be noted for its action in making an important change in the constitution of the Association. This change is to the effect that the Association will meet every two years, instead of annually, as heretofore. This will give a greater interest to the Conventions of the Association and allow exhibitors more time in which they can prepare their exhibits. This not only applies to the photographers themselves, but also to the merchants who find it a great task to make a creditable display every year without a large expense. This change of meeting time to every two years will also allow the various State associations an opportunity to hold their meetings during the alternate years.

Chicago has been selected as the next place of meeting, and with the change in the constitution, will bring the time in 1893, the World's Fair year. Let us all hope that the convention then held will be worthy of our men, our country, and our art.

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

EDITORIAL NOTES.

Mr. James H. Stebbins, the President of the Society of Amateur Photographers of New York, has been making some interesting experiments upon the action of sulphuric acid in concentrated form upon hydroquinone. This action gives rise to the formation of what is known as a sulpho-acid of hydroquinone. This sulpho acid can be made to unite with certain bases, and Mr. Stebbins has succeeded in making the calcium, barium and potassium salts. Up to the present time nothing useful as a developer has been prepared, but further work in this direction may give us something practical. Eikonogen is a salt of one of the sulpho acids.

M. M. Auguste and Louis Lumiere have been experimenting further with paramidophenol, hydroquinone and eikonogen, and come to the following conclusions: The three substances that we have been studying possess, from a photographic point of view, analogous properties. Paramidophenol, however, seems to present the greatest advantages. (1) It oxidizes more rapidly than hydroquinone and eikonogen; it is also more energetic, and, all the conditions being equal, it develops most rapidly. (2) The products of oxidization have no effect on the latent picture, and do not discolor the gelatine, whence the possibility of developing in the same bath of developer a very much greater number of plates than with the other developers. In making variations in the developing solution of the proportions of sulphite of soda, carbonate and paramidophenol, in order to arrive at the best compound and the best working, we have found it convenient to modify the proportions as in the following formula:

Carbonate of potash	40 parts.
Sulphite of soda	100 "
Paramidophenol	8 "
Water	800 "

It has been found by Mr. F. H. Latimer that the addition of oxalic acid to the ordinary blue print mixture decreases the time of exposure very considerably. The following solutions are used:

No. 1.

Ammonia-citrate of iron	120 grains.
Water	1 ounce.

Ammonia, drop by drop, till odor is perceptible.

No. 2.

Potassium ferricyanide	105 grains.
Water	1 ounce.

No. 3.

Saturated solution of oxalic acid.

Mix equal volumes of Nos. 1 and 2, and to 10 parts of the mixture add 1 to 3 parts of No. 3 just before using. A mixture containing 3 parts of oxalic acid prints about ten times as fast as ordinary blue paper. An addition of more than 20 per cent. of the oxalic acid solution gives difficulty in washing the lines white.

The following lines taken from our esteemed contemporary, *The American Journal of Photography*, are so true that we reproduce them here, and hope that

our readers will call the attention of photographers generally to them, and especially those who are not subscribers to any photographic journal: "It will be found that the busiest man finds the most time to read, and will go through the advertisements as well as the subject matter; while the man who has nothing to do and whose business is dull can never find time to read. It is the latter class, the photographic fossil, who has no use for magazines or journals. The only thing he can find time for is to continually harp on the fact that there is no future for photography as a business, merely because his own business is going to the dogs, and simply because he has not brains or common sense enough to subscribe to and read a photographic publication, and thus keep up with the requirements of modern need." Of course we should like everybody to subscribe to the BULLETIN, but we further agree with our contemporary and "we will say that if any one thinks another journal or magazine would suit their wants better, that is the serial to subscribe to. We have no objectlon so long as they subscribe to and read some current photographic literature of the day. Remember, they are all published ín your interest and for your benefit, as much as for the advancement of photography. It is only by this means that you can prevent the moss from growing on your back, and increase your bank account."

OUR good friend Mr. Cramer, of St. Louis, cannot but feel gratified as he reviews the week in Buffalo to recall the pleasure and enthusiasm which appeared simultaneously with himself in any party of the craft. His genial presence was always felt, and will often be remembered by associates with pleasure during the coming year. We hope he may continue to grace the coming Conventions for very many more years than they have yet existed. And, writing of this, we are forcibly reminded that the old saying, "Out of sight, out of mind," is sometimes far from a true one, for, though out of sight, by virtue of his absence in Europe, the name of George Ayres was so often on the lips of his many warm friends that it was impossible for him to be long out of the minds of any.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

The Vienna Art-Photographic Exhibitions.—Hypo in Blotting-Paper.—Testing Hypo.—Zeiss' Price List of Objectives.—New Normal Red Glass for Dark Rooms.—The Intensity of the Light of the Blue Sky in Different Regions.

WE have now a photographic exhibition in Vienna, and the newspapers are speaking in the highest terms of praise about it. But, nevertheless, there is a strong opposition to the jury selected. It has always been the custom to admit artists to such a jury, but only in the minority. In Vienna, however, the jury is composed entirely of artist-painters and sculptors, with the single exception of expert Mr. Luckhardt. Is that correct? I believe that a general cry of indignation would be raised if the jury for an exhibition of oil paintings consisted of professional photographers only. Is it therefore to be wondered at if similar feelings are expressed by the photographers? It is even not necessary to refer to photography. Suppose, for instance, an exhibition of copper engravings was opened, the exhibitors would certainly not demand a jury of artist-painters, but engravers. A well-known artist-painter declared in my presence that he did not

think much of a copper engraving, and he could not comprehend how Mandl had sufficient patience for seven years in which to finish his celebrated engraving of the Madonna by Rafael. During this time he could paint a hundred which paid better than the Madonna. In the latter point he is undoubtedly right, for he sells everything "still wet" from the easel. But what injury could such an artist do as jury member for copper engravings?

This branch is much nearer related to oil painting than photography. In a similar relation are all technical arts, to the art proper, and we know of several instances where exhibitors have decidedly protested against the admission of artists to a jury.

"The man," we heard a jeweler once say, "has not the least knowledge of our trade. How can he pass a proper judgment about the value and excellence of our productions?" The artist was not admitted as a juror, although he was an architect. But it is so everywhere. The juror must have a technical knowledge of the goods, he must know what can be accomplished and what cannot be done.

The same opinion is ruling for photography, around which even closer limits are drawn, than any technical art.

The exhibition in Vienna may be called a very good one. The too high requirements have led to a still more careful selection. But at the same time exhibits are said to have been admitted, which, by their careless technical execution (under exposure), etc., etc., were much commented on by practical photographers. I am not astonished about this. When I directed in 1864 the first international photographic exhibition in Berlin, I was surprised, how the artists passed some of the English pictures which our photographers failed to admire. They succeeded even so that some of those actually carelessly executed pictures (Miss Cameron's) received a diploma. One picture among those showed only the back part of the head of an old woman, with side-light—similar to the later Rembrandt effect. Everything else was shrouded in darkness. The artist, Gustav Richter, admired this picture particularly. Why? After years I recognized this figure in his well known picture: The Building of the Pyramids, for which he had used it. The figure is in the foreground.

The regulation in the jury paragraph, that pictures are also admissible which may serve the artist as a model, is entirely out of place. Under such a pretext pictures of the worst kind may find admission, if they contain only some little part which may be useful to the artist.

Lately some serious cases of pictures turning yellow after finishing have come to my knowledge again.

An eminent English photographer sent to me a number of finished enamel pictures with strikingly yellow spots. In his letter he says, that for three years he has had these spots, that all care during washing and mounting was of no avail, and that he actually is at a loss what to do. A box containing all preparations for the production of the positive pictures followed, with the request to try and find the cause of the evil. All salts, the gelatine, the albumen paper and cardboard proved to be in a good condition; finally, one piece of paper remained to be examined, a thick sheet of blotting-paper, which was used by the photographer to absorb the superfluous silver solution after silvering the albumen paper before drying. This paper contained great quantities of hypo. This was the cause of all the evil. For the last twenty years I have already repeatedly called atten-

tion to similar cases, and that for the production of ordinary white papers and cardboard, colored rags bleached with chlorine are used. The superfluous chlorine is again removed by an addition of hypo, whereby a little of this salt remains.

With superfluous silver in contact, this salt decomposes very soon by precipitating silver sulphide which appears yellow in a thin layer. If silvered paper is therefore dried with such a paper, the formation of yellow spots on the moist places may be expected with certainty, particularly as the reaction takes place only after some time when hypo is present in only a small quantity. But if the hypo is contained in the cardboard, the decomposition will proceed still slower by the aid of the carbonic acid of the atmosphere, as sulphur separates, which acts upon the ready silver picture, the salt entering the picture through the small quantity of moisture contained in the cardboard. In such cases the decomposition and yellow coloration may not take place for months. I have, therefore, for years—after many suits before the courts about bad cardboard—recommended to the paper manufacturers to take sulphite of soda in place of the hypo, which, if in a pure state, is not injurious to the pictures. Chemical factories have declared to me, that recently the sulphite of soda has come more and more into use, and since that time we have less complaint about that defect, at least in Germany. But the English case shows that the improved change has not yet become known everywhere.

Similar defects may also take place in drying the finished moist pictures between blotting-paper.

Ordinarily, the starch test is applied for the investigation of traces of hypo (Vogel's handbook 3d Edit.). This does not only show hypo, but also oftentimes harmless reducing substances, for instance, sulphite of soda or organic matters. By the following test hypo can easily and with certainty be recognized.

A few strips of the paper are boiled for a few minutes in distilled water. The filtered solution is mixed in a beaker glass with a few drops of pure nitrate of silver solution, 1:20. If the paper contained hypo, the solution, after a short time, particularly during heating, will become yellow and then brown according to the quantity of hypo, while in the absence of hypo, the same remains competely clear, sulphite of soda does not show this appearance.

Other reducing substances may reduce the silver salt under the foregoing test, but they will then precipitate a black silver powder without the coloration of silver sulphide from yellow to brown. In this manner one may also recognize if gelatine plates have been washed properly. The dripping liquid is secured and tested in the prescribed manner.

With regard to cases of yellow coloration of pictures, which is frequently ascribed to cardboard containing hypo, I would remark that I knew cases where a quick yellow coloration of the pictures took place notwithstanding all care and good cardboard.

A reason for this was that the quantity of hypo used for fixing was too small. Too many pictures had been fixed in the same bath.

To one sheet of picture-surface 6 grams of fixing soda should be used. In a fixing bath which contains 60 grams of fixing soda (to each 300 grams water), not more than 10 sheets of picture-surface should be fixed.

Recently the price list of the new objectives of Zeiss, in Jena, has been pub-

lished, which I have recommended to you already as excellent instruments. I clip from the same the following interesting facts:

The firm of Voigtlander, in Brunswick, has acquired the right to manufacture the Zeiss anastigmat-doublet, in equal execution and at the same price as Zeiss. It is further acknowledged that the idea of the triplet-construction (spherical and chromatic correction of the objective by a middle lens) was already recommended, in 1885, by Dr. Hugo Schroeder.

The designation of the diaphragm openings is very recommendable with 1, 2, 4, 8, 16, etc. They commence with the smallest (openings $\frac{1}{100}$ focus), and the opening of the others is selected in such a way that each following requires only half as much exposure as the preceding one. The openings of the four kinds of objectives, which were furnished by Zeiss, are different. For the triplet it is $\frac{1}{6.3}$, for the three kinds of anastigmats $\frac{1}{7.2}$, $\frac{1}{12.5}$ and $\frac{1}{18}$ of the focal distances. The visual angle of these anastigmats increases with the reduction of the fractions. But Zeiss succeeded in increasing the rapidity of the wide angle to a very remarkable degree, so that he can produce even an instantaneous angle (Series IV. of the anastigmats), which, with diaphragms of $\frac{1}{18}$ — $\frac{1}{25}$ of the focal distance, will cover a plate of $1\frac{1}{5}$ of the focal length.

The table at the end is very much to be recommended, which for each plate size mentions the numbers of the objectives recommended according to preference for rapidity or wide angles.

From Jena another novelty is also to be expected soon. The technical institution, where the celebrated optical glasses are made, has offered to make a red normal glass for photographic dark rooms. Considering the fact that from 20 red lights tested by me lately, I found only a few pieces which admitted the passage of red light only, and that of the other lights there could only be used some very small parts, the furnishing of a pure red glass can be only hailed with pleasure, particularly for the color sensitive plates, which indiscriminately will all fog under a bad red light. While we have optical glasses in Germany, we are accustomed to get the cheaper glass for plates from Belgium, although the duties are pretty high.

Another step has been made forward in the knowledge of the brightness of the sky.

That the brightness of the several parts of the blue sky is not equal, is shown already by the color. The zenith looks much more blue, the horizon more whitish. In landscape photographs we can therefore observe how the intensity of action increases from above toward the horizon. This is shown best on a short exposure as, for instance, in a cloud photograph.

W. Brennaud has now determined the brightness of different parts of the blue sky photographically and quantitatively by blackening of light-sensitive papers. For this purpose he makes a so-called mitrailleuse-photometer. A number of tubes are put up in a semi-circle fan-shaped; at the point where their ends meet they stand upon a half circular disk whose edge is spread with a stripe of the sensitive paper. We have here, so to speak, a Vogel tube photometer, but whose tubes are not parallel, but are directed in a half circle toward the different points of the sky. The paper stripe exposed under each tube will show now different colorations at equally long exposure, according as that part of the sky toward which the tube was directed is more or less bright. This has shown that the brightness of a part of the sky decreases with the decline of the sun. If

J is the brightness of the sun (which of course increases and decreases), and a the angle distance from the sun of a part of the sky, the brightness of the same according to Brennaud is $\frac{J}{\sin. a}$.

Berlin, July, 1891.

BUFFALO CONVENTION—ADDRESS OF WELCOME.

BY MR. H. McMICHAEL.

Mr. President, Ladies and Gentlemen, Fellow Members of the P. A. A.:

In honoring the City of Buffalo, and especially the patrons of photography of this vicinity, by accepting an invitation to hold your Convention for 1891 here, you express a trust that a hearty welcome will be given you. It has now become my duty, as one of the resident members here, to say a word in accord with that confidence implied in your acceptance, and to impress it that we—that all friends of your Association in this city—where certainly there is no reason why you should have opponents—have the liveliest feelings of gratitude that you have come amongst us, and we tender you our sincerest thanks for your presence, and felicitate ourselves in the belief that whatever may be the transactions of this meeting, in its results, the greatest benediction will be ours.

We welcome you here, then, not only because your presence is eminently genial, and association with you is most happy, but also because we hope to be benefited by your counsel, your examples, and your instruction, both theoretical and practical.

We greet you as examplers and improvers of one of the greatest, because one of the most beneficent of arts, and as such it is a great happiness to have you unite with us in the present year's Convention.

We need and welcome the inspiration to further advancement in our profession your presence at this time may be trusted to give us. Certainly as photographers we have great reason to take pride in our guild. In no other calling is there to be found greater inducement to make advancements. Whatever excellence we may be able to attain to-day is only a reason and encouragement to make greater improvement to-morrow. Our art is not an attempt to reproduce nature, but to exemplify all that nature suggests and teaches as possible to human effort. Nature needs no helpmate, but does welcome co-operation in enlisting man's admiration and man's enjoyment of existing things.

And so anything which helps to keep alive the features of departed friends, helps also to continue to revive the best influences of their lives, and must consequently be beneficent in its effects.

The work of the photographer makes this beneficence universal, for in all homes, from the most luxurious to the most humble, it may be availed of at will. Though this is only one of its values, it alone is a reason why everything that may contribute to the improvement and perfection of our work, should be sought. And if in other callings the workers find help by association for their mutual improvement, certainly our patrons and the public have a right to claim and expect that photographers should seek to learn by association with each other the best methods and the surest means to the best results in the pictures we produce for their approval.

All this is implied and emphasized in our organization, and so this Conven-

tion is intended especially for business, and business always means short speeches and prompt action; heeding which fact, I close; simply, but earnestly, welcoming you all to Buffalo and our homes and hearts, and with the heartiest wishes that your meeting here will give occasion evermore for pleasant memories.

PRESIDENT HASTINGS' ANNUAL REPORT AT BUFFALO CONVENTION.

To the Officers and Members of the P. A. of A.:

For this, the Twelfth Convention, we meet in annual session, to review the past, and plan for the future. There is not much to be said except in repetition. The financial condition, January 1, 1891, shows a balance of $2,328.22 in the treasury. The amounts received up to this morning, for this Convention, are as flattering as have been shown in the past, and give us reason to be assured that this year will be a financial success. The benefits to be derived from membership are seen every year by associating, observing and putting together the facts gleaned at the annual conventions. Practical talks are much better for us than study of theory. To increase our membership is the one grand desideratum, and this cannot be done in an hour, but it can be attempted, and one way I shall suggest will be to stop the petty jealousies and inconsistent criticisms, and talk sense instead of continually finding fault without suggesting proper remedies. It is not claimed that this Association is run on principles which cannot be improved upon, but with experience difficulties will be overcome. Remedies suggest themselves, and everything will become easier, and to a more practical condition. Let every one try to interest his or her neighbor to come into the Association, showing the benefits to be derived therefrom, and it cannot be disputed that it will tend to multiply our

By a system of circulars, mailed by us to reach a great majority of photographers this year, we feel that a great deal of enthusiasm has been aroused, and that the results of the effort and expense of the same have contributed in a marked degree in making this Convention one of large attendance and success.

The art principles we are trying to inculcate into our Association by the awarding of special prizes, which will draw forth latent talent, embracing the ideal, poetic, and the art of composition, will be seen by continued competitions, and I think the public will appreciate and acknowledge it in an approving manner. Do not give up the idea that we are not able to conceive and execute in a manner which will give us a standing approaching a Meissonier, or any that might be named ; we surely do not want to be simply machines, controlled by our patron's whims, but to rise higher and higher and be accorded the praise and credit belonging to us. Many are in the work without any love for the art aside from getting a living, and too often those who are trying to reach the high standard desired are baffled thereby by lack of patronage, because the scum of the profession are working at an inconsistent remuneration. Merit will demand recognition, even though it may come slowly. Therefore, persevere, and the goal will be reached. Retrenchment has been called for in the expenses of this Association, but in a three years' service on the Executive Committee, I fail to see any way in which any great saving can be accomplished. If you appropriate a less sum than one thousand dollars for awards and badges you will be unable to offer the special inducements which attract the attention of the workers, and it

will make our art department less attractive and instructive than at present. The hall expense, which is quite an item, varies from year to year, and usually the committee are quite at the landlord's mercy, as it is seldom that more than one hall appropriate for holding the Convention can be found in any city. The idea of merging the offices of Secretary and Treasurer into one can be done, but that would necessitate the creating of a new office—that of third Vice-President, who could act as Secretary during the business sessions of the convention, and yet our honored Treasurer's book shows that for the past six years he has received only an average of $288.61 per year, so that would not improve our condition to any great degree. A saving of about $400 has been effected this year over our Convention held in Boston on hall accommodations. A permanent home recommended by my predecessor in office is an idea well worthy your consideration, believing that even if the building is not owned by the Association it can be leased and sublet so that a revenue would be received. It would be the storehouse for our donations, art works, records, etc., etc. It would be less expensive for our stock dealers, as their spaces could be kept without the necessary expenses for re-fittings each year, as now. A proper light for the art department could be put in, so that all exhibitors would be placed on an equal footing, regarding the lighting of their pictures; a studio properly arranged for practical working also could be used as an audience room, these would, with a few other necessary arrangements, make a very complete home for this Association. Our committee on this subject will report.

I trust the project will not be abandoned, believing the records of this Association too valuable to be at the mercy of the flames. I directed the Secretary to deposit them in the Garfield Safe Deposit vaults in New York, at an expense of $3 a year, which is less than the amount paid for expressage year by year from secretary to secretary and convention meetings.

Our Association should be well represented at the World's Fair, and the committee in charge of arrangements ought not to leave a stone unturned to make it the grandest show of photography ever seen.

In our profession we are unjustly taxed for fire insurance, in that the rates established when (we will allow) the risk was more hazardous, have not been decreased in proper proportion, and I think this Association ought to raise its voice against such exorbitant rates, and act in accordance with such resolutions as may be passed, with the proper authorities.

In conclusion, I wish to say that the exalted honor I have received by your suffrage, the courtesy and assistance rendered to me by the officers and members of the Association, will ever be remembered with feelings of pride and pleasure, and I hope that my efforts to make this Convention a success will be acceptable to the Photographers' Association of America.

ORTHOCHROMATIC PHOTOGRAPHY.

BY JOHN CARBUTT.

[Presented to the Buffalo Convention of the P. A. of A]

In the old collodion wet process days it was common for persons desiring to be photographed to first call on and consult with the photographer as to what colors could be allowed in the drapery to be worn while being photographed, many having found disappointment in their photographs, owing to the false

rendering of colors by the wet collodion process. On the advent of the gelatino-bromide plate the results were somewhat better, owing first to the greater sensitiveness of the dry plate and its better rendering of the color values; but it was not until the introduction of the orthochromatic or color-sensitive plate that it was possible to photogragh objects containing the colors of the spectrum rendered at their true color value in monochrome, it being well known that both the wet collodion process and plain dry plates render blues lighter and yellows and greens darker than is represented to the eye. But by the use of orthochromatic plates this defect in our beautiful art is corrected, and it is now possible to reproduce both objects of nature and paintings in their true color values.

When I commenced making the orthochromatic plates in 1886, many scientists and amateurs in this country were experimenting in orthochromatizing the commercial plain dry plate, and while good results can be obtained by this method, it was found that they lacked the important quality of keeping, and this fact being made known through the photo journals, led many photographers to believe it applied also to the commercial made orthochromatic plates; but I am able to state most emphatically, as a result of personal experience and experíment, that the orthochromatic plates made from emulsions containing the color sensitizer have just as good keeping qualities as those made from plain emulsions.

Our professional photographers, on the first introduction of the orthochromatic plate, were slow to make use of them, having the idea that it was necessary to use a color screen under all conditions. This, of course, was very erroneous, and with increased knowledge among professional photographers of the value of color-sensitive plates, they are being used more and more for all general work, especially for outdoor views. The art publishers in this country were the first to recognize their value, and the very fine reproductions in monochrome of paintings issued by them within the last few years are the result of the use of orthochromatic plates.

Now in regard to the color screen and when to use it. In my opinion it is misleading to say that no color screen is required. For general work of the studio, landscapes, flowers, and such subjects as contain no deep orange or red, a color screen is not necessary, but in copying paintings in which light blues, light greens and reds are present, it is necessary to use a screen, the color being selected to suit the subject. A pale yellow screen is generally sufficient, but when the subject contains both blues, deep orange and red, then a color screen of a light orange tint should be chosen and the exposure increased. It is well to be provided with screens of different tints: a pale yellow, a yellow of deeper shade, and a light orange. On examining a painting to be photographed through one of the color screens it is not difficult to choose the right one; the blues should appear of a greenish shade, the light yellows and whites would then have their relative value in the photograph.

It is rarely that a color screen is needed in photographing landscapes, except when mountains brightly lit, or white clouds relieved against a blue sky, or a hazy distance; then a pale yellow screen will be of value, and by increasing the exposure will enable detail in the near foreground to be better rendered. Examples of this can be seen in the landscapes by Dr. Charles Mitchell, in the Exhibition Hall, and the photographs of paintings and interiors by Charles Truscott.

I feel that I cannot close this paper without strongly advising you, the professional portrait photographers of America, to use the orthochromatic plates in your studio work, and as the cost is the same as plain plates, there is no excuse on the score of expense why you should not, especially as any object that can be photographed on a plain plate can be equally, if not better done, on an orthochromatic plate; and there are many objects that can only be correctly photographed by using orthochromatic plates. They are no more difficult to manipulate, simply requiring to be shielded from an excess of light during development. The best light I find is that coming through an orange red medium, and as the orthochromatic plate is more sensitive to yellow than to blue, I would suggest that the walls of the studio be tinted a pale yellow, the side screens also, and the curtains to the sky-light of yellow cheese cloth. The results in your portraits would be blue eyes rendered darker, auburn hair lighter than it is usually rendered, freckles much less conspicuous, and colors in drapery rendered with a truer color value, together with a more harmonious result generally, and, not the least important, a picture that will enable you to secure better prices for your work.

WORKING WITH ORTHOSKIAGRAPHIC (ORTHOCHROMATIC) PLATES.

BY L. DAVID AND CH. SCOLIK.

(*Continued.*)

Interiors.

Rooms with light furniture and decorations may be taken very well with ordinary plates, but if furniture and decorations 'are dark with gold ornaments and velvet coverings, then the application of orthoskiagraphic plates is required without regard to the time of exposure.

The brightness of the yellow glass is here also determined according to colors present which reflect blue.

If blue is entirely wanting, as is generally the case in rooms fitted in renaissance style, only a very light yellow glass is to be applied. It is to be recommended to cover the windows with yellow tissue paper, or to use yellow curtains. Two things are attained thereby. In the first place, the yellow glass is replaced, and, secondly, the light is more diffused, so that the otherwise unavoidable halo's (solorization) around the windows do not take place. By means of orthoskiagraphic plates (erythrosine silver plates preferred) interiors can very well be taken by artificial light. Interiors of churches are very difficult, because the yellow glass, which is necessary to bring out the gold and dark paintings in opposition to the blue and white that may be present, essentially extends the time of exposure, which, even without yellow glass should be of pretty long duration. It is very seldom only, that artificial light can be applied here, on account of its little intensity not being sufficient for large rooms, and the difficulty of placing the lamps. A successful application of the yellow colored magnesium flash light is just as little possible in such extended rooms, as previously described.

Glass paintings, such as are generally found in churches, are very handsomely reproduced with otheskiagraphic plates (by application of a pretty dark yellow glass), and the exposure is then a proportionally short one.

Exposure, Development and Finishing Orthoskiagraphic Plates.

In the foregoing we have repeatedly called attention to the fact, that the time of exposure with orthoskiagraphic plates depends, aside from ordinary circumstances, upon the intensity of the yellow coloration of the color filter.

As an average condition it may here be mentioned, that an orthoskiagraphic plate, with application of a yellow glass, requires three times longer time of exposure than would be needed by an ordinary plate. With a dark yellow glass a six to ten times longer exposure is necessary. For this reason it is advisable, to look out for the best light, and when convenient to take the objects in direct sunlight, because this is rich in yellow rays. If one is obliged to take the object in diffused light, the color of the latter is of great importance.

With a blue sky the diffused light is of less effect than when white clouds cover the same. Gray fog absorbs and reflects a more bluish light, which reproduces yellow and red tones less strongly. With artificial light the time of exposure depends upon the strength and the more or less yellow coloration, and the necessary information should be looked after by a trial test.

That oil paintings require a longer exposure than water-colors has already been observed. With silks or woolen stuffs it is a question whether they reflect the light which they have received more or less completely. Glossy and smooth stuffs will therefore be exposed quicker than coarse and woolen ones of the same color. Regarding the yellow glasses, we have already mentioned that collodion films reduce the transmitted light less than glass.

In order to avoid very small diaphragm openings, it is good to employ lenses of long focus, which show a great depth of sharpness. Such lenses are, of course, much weaker in light, and require, therefore, a time of exposure of almost the same duration as objectives with small diaphragms and short focal distance. As a disadvantage of the objectives with long focal distance it should be mentioned that in the production of copies, which require a precise sharpness, they are not readily applicable, because they do not give a sharp-cut picture when a ray filter for the stoppage of the blue ray is inserted.

That the original sensitiveness of the mother emulsion is just as much recognized in orthoskiagraphic plates as ordinary ones is a matter of course. All other minor conditions influencing the time of exposure with ordinary plates also rule for orthoskiagraphic plates.

Regarding the development of orthoskiagraphic plates it is to be remarked that every developer is applicable which furnishes good results with ordinary plates. But as the former are very sensitive to red light, greater care should be taken in the development than with ordinary plates.

The developing solution is poured upon the plate as usual in subdued red light, and the tray is at once closed with a good-fitting cover. Only after thirty to forty seconds after the sensitizing color film has already been dissolved and the image has appeared, the negative should be looked at, and then only for a short time.

If no cover is handy, the tray should be placed in the shade of the lamp or in a dark corner, and when taken out the plate should be held with the edge toward the light.

A harmless light is obtained by placing dark orange-colored and green lights of glass over each other. V. Schumann recommends to reduce the red light with a sheet of brown paper, or to apply brown light.

Dr. Stolze, in Berlin, has manufactured lately orange-colored films, which applied in layers of three to five are said to absolutely exclude all injurious light and furnish also a light which is pleasant to the eye.

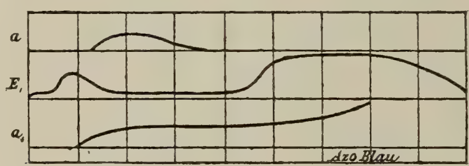
The appearance of the picture is a normal one at correct exposure. The fixing, washing and eventually intensifying is quite the same as with ordinary plates. In cases of too short exposure, as with oxalate development, a soda bath (1 part soda with 2,000 to 5,000 parts of water) is of good effect. The orthoskiagraphic plates, if sensitized with eosin coloring matters, retain a reddish coloration, but this is of no bad influence.

THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES.

BY J. J. ACWORTH, PH.D., F.I.C., ETC.

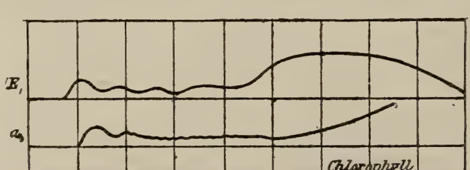
(*Continued.*)

Of the so-called Azodyes I tried *azoblue.* In a gelatine film this dye shows a wide, but not very intense, absorption, chiefly in spectral yellow; it begins at $C\frac{1}{3}D$, reaching a maximum at a little before D; at $D\frac{1}{4}E$ it gradually becomes less, and nothing at a little beyond E.



For color-sensitizing purposes, about .05 to .1 gram to every 2 grams AgBr is a suitable quantity to employ with about .05 $AgNO_3$. Spectral sensitiveness begins on the less refrangible side of A, but does not rise much until at a; at B it reaches a maximum from which it descends to almost nothing at D, remaining stationary until the beginning of blue-violet sensitiveness, when it quickly rises to its principal maximum. The absorption of this emulsion begins just before C, rises gradually until D, after which it keeps pretty uniform until past the blue, when it again rises.

Of natural dye-stuffs I have not tried many. *Chlorophyll* gave me many uncertain results. Curves of one of the more successful are shown. The sensitiveness curve may be considered to consist of at least three bands in the less refrangible part of the spectrum. The first rises to a maximum between B and C, the second just before D, and the third between D and E. Beyond E it again increases and shows intense blue-violet sensitiveness.



The absorption of this emulsion is indicated as regards the less refrangible band—this begins at a little before C, attains a maximum at $C\frac{1}{3}D$, after which the absorption is not sufficiently clear to be accurately drawn.

Beyond those already described, I have experimented, though unsuccessfully, with the following:

Coerulein.—I obtained from Dr. Schuchardt a sample of Coerulein Sulphite (Coerulein S.). With this dye I was unable to get any appreciable color sensitiveness in the less refrangible part of the spectrum. Napthol blue caused my emulsions to fog on development.

Methyl Blue.—This dye, in gelatine, shows two intense absorption bands, one in the orange and the other in the red. I was particularly anxious to get results with this dye and tried every means with this object in view, without any success. Every result would fog on development, do all I could to prevent it. The quantity of the dye employed varied from 1 to 2½ per cent. to the AgBr present in the emulsion and most of these emulsions showed splendid absorptions.

With colors of the alizarine series I was also unsuccessful. I experimented with alizarin, alizarin blue and purpurin. The cause of failure here was the difficulty I experienced in dissolving these bodies. With purpurin I tried several plans for getting an extra quantity of the dye into the emulsions, but without satisfactory results.

With extra rapid dry plates the period of the primary action is so exceedingly short that even with a slight light-impression a developable image is obtainable, and even the shortest lighting causes a general reduction (fogging). On the contrary, on less sensitive, clear-working plates a marked effect is shown by additional lighting.

Candle-light can only be used for this purpose at a very great distance, or when greatly weakened. According to Eder, candle-light worked better when thrown through a ruby glass. His experiments showed that a slow dry plate of 15 Warnerke, after being exposed from two to six minutes immediately in front of a ruby lamp (candle-flame), the sensibility was raised to 19–20 Warnerke Sensitometer, which was equal to a plate three times as sensitive.

E. Himly, in Berlin, patented a so-called (Hilfsbelichter) auxiliary exposer, which introduced diffused light into the camera (D. R. patent 38,684, August 6, 1886); *vide* Eder's "Year Book," 1889, p. 87.

Preliminary lighting with dry plates of high sensibility is partly unnecessary, partly dangerous, and therefore is not advisable in actual practice.

In all probability the same results obtained on gelatine dry plates by auxiliary exposure may be reached in a purely chemical manner without the action of light. A minimum reduction of silver bromide must be introduced. This takes place by extending the so-called ripening process. In fact, the continuation of the digestion of the emulsion leads to fogging, and otherwise it is exceedingly dangerous to the rapidity of the emulsion, when treated with reagents, which are apt to change the reduced bromide (sub-bromide) back to its normal condition.

(*To be continued.*)

HIS ONLY VICE.—Has your son any vices, Mr. Blank? Pardon the question, but I like to know all about the boys I take into my office.

No; Henry has none that I know of except, perhaps, amateur photography.

Well, that's a negative sort of a vice. I never met an amateur photographer yet who took anything worth talking about, and I think I may trust your boy. Send him along.

PRELIMINARY, SECONDARY, AND SUPPLEMENTAL LIGHTING.

BY DR. J. M. EDER.

(*Continued.*)

In the year 1887, the secondary lighting, by means of violet light, was recommended. Scotellari made an opening in the cap of the lens; this he covered with aniline violet. This opening was opened or closed at will by a rotary disk. The plan was to expose with open lens as usual, only much shorter, then put on the cap and turn on the violet light to complete the exposure. This process reduced the time from fifteen to seven seconds; this was exclusive of the supplemental lighting of two seconds.

Gillard recommended these colored diaphragms not only for a reduction of the time of exposure, but on account of the peculiar mezzotint effects. He used diaphragms made of gelatine sheets, which were colored violet or dark green.

Frequently the preliminary or secondary lighting was made by a white light. Werge used two thicknesses of tissue paper, giving four seconds.

Haugk suggested to expose a trifle less than half the usual time, then for a few seconds (say one-fifth of the usual time) to hold a piece of ground-glass before the lens, and then cap.

Melchion in portraiture exposed his wet collodion plates to a diffused light for two seconds by holding a ground-glass in front of the lens, and then made a normal exposure of eight seconds, the result being a plate equal to an exposure of fifteen seconds without any preliminary lighting.

Foxlee also was a strong advocate in favor of supplemental lighting with diffused white light.

It was further recommended to have an opening in the cap, covered with opal glass, this to be two-thirds the diameter of the lens; the preliminary lighting to be one-seventh of the normal, with the result of reducing the actual time of exposure from twenty-four to fourteen seconds.

Richard closed the opening in the cap with a thin piece of tissue paper. The supplemental lighting should not exceed three-fifths of the normal time.

Wyler preferred to make the preliminary or supplemental lighting by candle-light in the dark room, as he had more control over the exposure than in the camera. His plan was to expose the wet plates for ten seconds to the candle-light.

Chapman subjected his astronomical plates to the influence of lamp-light before he started development. This was also recommended by Worthley.

With under-exposed wet collodion plates Prümm found that the most practical supplemental exposure was to flood the plate with a yellow light in the dark room.

It is requisite with both fore and after exposures to take the greatest care that the light does not act too long, as this results in fog; while too short an action shows no improvement whatever. For instance, where an exposure under yellow glass of ten to fifteen seconds in diffused daylight already causes fog (wet collodion plates), a ruby glass with five to ten seconds under the same conditions gives perfect results, whereas a combination of the ruby and yellow glass, even with lighted exposure, gave no noticeable effect whatever.

These additional exposures, notwithstanding the occasional results obtained, can only be depended on as a makeshift to save an under-exposed plate, as in almost every case fog results. Further, properly exposed plates are always preferable.

Quidde preferred the subsequent exposure.

A considerable reduction of the light is necessary with all the nodalities of additional lighting, so that the proceeding can be controlled. Therefore, translucent mediums can only be used when violet or white light is used. When green or yellow discs are used, more transparent mediums are available, thanks to the fact that the colors admit but few of the active rays. It will be noted that in all these processes the blue and the violet rays are the most active, red carmine paper admitting even a few of these rays. Plain red or yellow glass proves ineffectual.

In this connection, we will introduce the proposal made in 1850–51 to use white for photographic purposes. This idea originated with Löscherer, in Munich, who always operated with a camera the inside of which was white, instead of black. He declared that thereby the action of the light was greatly increased.

Immediately after the publication of this statement, Blanquard-Eveard stated that he obtained pictures in shorter time, when the interior of the camera was white, instead of the usual black. This was substantiated by Kilburn, but denied by Claudet, or at least restricted to such cases where the outer light was not strong enough to form a strong image. Notwithstanding these experiments, they were again brought up by Blair twenty years later, but he soon returned to the dark camera and a preliminary exposure under red light.

Günther, in Hanover, 1855, suggested a modification, in which he advised a blue lilac color in place of black.

As a matter of fact, some photographers (Bellac and others) actually reduced the time of exposure with similar apparatus.

In the resulting discussion, in which Horn was especially active, it was soon shown that the reduction of time was at the expense of the picture, as the negatives were always flat. As a matter of fact, neither the quantity nor intensity of light within the camera is under any control; and even if in some exceptional cases the requisite measure of supplementary lighting is attained, in the great majority of cases it results in failure.

Consequently this expedient is practically useless; it is far more unreliable than the previous processes.

Carey Lea condemned the white and red interiors of the camera. Especially with a strong light (landscapes, etc.) the bright high lights would spoil the whole view, and result in fog and flatness.

De Constant, who again investigated the matter in 1870, found that an entire white camera resulted in a flat picture, little relief, and a confused appearance, as if the plate had been wiped over.

If the top and bottom of the camera were black and the sides white, the resulting picture combined sharpness with softness and relief, especially on the part toward the black sides. If the bottom of the camera was black, it added to the clearness of the face. If the top of the camera was dark, the clothing was clearer.

Consequently, as the face in relation to the drapery usually has too much

light, better results were obtained when the top and sides were white and the bottom black.

As will be seen from all the above suggestions, no precise method has been evolved which could be adopted in regular practice.

II. *Primary and Secondary Lighting of Gelatine* (*Bromide of Silver*) *Dry Plates.*—Gelatine dry plates may also be improved during development if the necessary caution is used. It is perhaps superfluous to remark that with the greater sensitiveness of the gelatine dry plate it is much more difficult to gauge the correct time for supplemental lighting than is the case with the wet collodion plate, and the difficulty of preventing fog is greatly enhanced.

With extra rapid dry plates the period of the primary action is so exceedingly short that even with a slight light-impression a developable image is obtainable, and even the shortest lighting causes a general reduction (fogging). On the contrary, on less sensitive, clear-working plates, a marked effect is shown by additional lighting.

Candle-light can only be used for this purpose at a very great distance, or when greatly weakened. According to Eder, candle-light worked better when thrown through a ruby glass. His experiments showed that a slow dry plate of 15 Warnecke, after being exposed from two to six minutes immediately in front of a ruby lamp (candle-flame), the sensibility was raised to 19–20 Warnecke Sensitometer, which is equal to a plate three times as sensitive.

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OUR ILLUSTRATION.

Shakespeare never had a better interpretess of that sweet creation of his brain, the fair Viola, than the beautiful lady whose picture forms the frontispiece of this issue of the Bulletin. Of her he well might say:

> 'Tis beauty truly blent, whose red and white
> Nature's own sweet and cunning hand laid on.

Sarony also never had a better example of sweet and womanly grace than the subject that stood before his camera when he caught the form of Miss Wainwright disguised as Cesario in the play of "Twelfth Night."

We are very much pleased to be able to give our readers such an excellent example of beauty and fine photography combined with an interesting illustration of the genius of England's greatest poet.

The picture is worthy of the closest study by all photographers. It is an

illustration of the highest artistic effects in modern portraiture, the figure being without any of those surroundings that disturb the eye, the modeling showing the master-hand in the management of the light, while the print exhibits the finest skill in the development of the negative. Such a combination of good qualities in one picture it is rarely our good fortune to be able to present to the readers of the BULLETIN.

CONVENTION NOTES.

THE officers for the next Convention to be held in Chicago are as follows: President, W. G. Entrekin, of Philadelphia; First Vice-President, Frank Place, of Chicago; Second Vice-President, C. T. Stuart, of Hartford, Conn.; Secretary, Adam Heimburger, New Albany, Ind.; Treasurer, G. M. Carlisle, of Washington.

Among those attending the Buffalo meeting we notice the following well-known and active members: President, G. H. Hastings, of Boston; G. Cramer, of St. Louis; John Garbutt, of Philadelphia; W. G. Entrekin, of the same city; Mr. and Mrs. W. H. H. Clark, of St. Louis; W. I. Lincoln Adams, of New York; Messrs. R. A. and F. A. Anthony, of our publishers; F. E. Colwell, of F. Hendricks & Co., and his brother, S. Colwell, Jr., from George R. Angell, of Detroit; T. H. Blair, of the Blair Camera Co., of Boston; Mr. Butts, of Tucker & Butts, of Buffalo, who extended many courtesies to the visitors; L. W. Seavey, of New York; Wilfred A. French, of Boston; Herr Wuestner, of the Eagle Dry Plate Company; H. McMichael, of Buffalo; E. M. Estabrooke, of New Jersey; C. B. Conant, of New York; D. B. Sweet, of Chicago; D. C. Hoover, of Rochester; H. S. Bellsmith, Mr. Prince, of L. M. Prince & Bro.; Mr. Kothe, of H. Lieber & Co.; M. J. Govan, Frank A. Place, Thomas Pattison, George Murphy, John Hovey, Rochester; W. H. Partridge, James Esson, of Ontario, Canada; E. B. Core, C. H. Loeber, R. H. Moran, R. B. Mullett, D. P. Thompson, E. Decker, George Barker, Mr. Teele, of H. Q. Sargent & Co.; Mr. Allen, of Allen Bros.; Mr. Miller, of Simpkinson & Miller; E. J. Pullman, Miss Catherine W. Barnes, E. P. King, M. F. Hatton, W. A. Davis, George G. Rockwood, of New York; E. C. Dana, Messrs. C. C. & H. H. H. Langdill, of New York; L. C. Overpeck, A. L. Bowersox, E. Long, of Quincey, Ill.; J. M. Brainard, George Sperry, John G. Hood and J. W. Williams, of Philadelphia; W. Stuber, S. L. Stein, Charles Hetherington, and Messrs. Hastings and Wood, of A. M. Collins Manufacturing Co. We name only those with whom we were able to exchange courtesies. We must not forget also Mrs. C. H. Hastings and Mrs. Gustave Cramer among the ladies present.

THE ANTHONY PRIZES AT BUFFALO.

THE prize of $50 offered by E. & H. T. Anthony & Co. for the six best portraits from life made on the N. P. A. albumen paper, was awarded to Mr. George F. O'Connor, head printer for Dana, of New York.

The prize of $50 for the best six landscapes made on the N. P. A. paper was awarded to Mr. W. R. Harrison, head printer for Hargrave & Gubelman, of Jersey City.

The judges were E. Decker, W. G. Entrekin, and George Sperry.

Speaking of his work, Mr. O'Connor said that he always treats his paper differently for weak or strong negatives: silvering for the former a trifle longer than for stronger negatives. He prefers the N. P. A. rose pink to any other tint, owing to the great softness and brilliancy obtainable, when toned after his methods.

The bath which he used on this collection, and on all his work, is made up of half sal soda and half borax, with a little salt in toning bath. His hypo solution he combines in the proportion of 1 to 10, and fixes for fifteen minutes, leaving weaker prints two or three minutes less than that time in the fixing bath. He then fixes in salt for five minutes, and washes in running water for a half hour. For burnishing he uses nothing but plain Castile soap.

The negatives from which this collection was made show a wide range of printing qualities from one requiring three sheets of tissue in printing to a strong brilliant one for plain printing.

Mr. O'Connor has been in his present position for twelve years, and we do not doubt that he will continue in it many more.

Mr. W. R. Harrison, head printer for Hargrave & Gubelman, of Jersey City, tells us that he did not know anything of the intended competition until the Thursday P.M. previous to the opening of the Convention, and that he printed on Friday and shipped his work on Saturday, treating it precisely the same as his regular gallery work. He likes the N. P. A. paper for its simplicity of working. At this time of year he uses a 40 degree bath containing a little carbonate of silver, toning with a neutral bath of bicarbonate soda, washing in four changes of water, the fourth containing salt. He fixes it in a bath of 1 to 16 and burnishes with dry Castile soap. Mr. C. F. Gubelman, who made the negatives on his recent European tour, says that the prints obtained by Mr. Harrison, are far superior to the best he had made from them abroad. Mr. Harrison has been with Hargrave & Gubelman for five years, prior to which he was with Mora and also Nichols & Handy, having learned his business with McNabb.

He believes that he has used more than 400 reams of paper since he began, and of this amount, all but a very small portion has been N. P. A.

THE CRAMER PRIZES AT BUFFALO.

Three prizes of $100 each for the three best collections of portrait work made on Cramer plates were awarded to Dana, of New York; Rose, of Providence; and Stein, of Milwaukee.

The $100 prize for landscapes made on the Cramer plates was awarded to W. H. Jackson, of Denver, Colorado.

The $100 prize for instantaneous work was awarded to Hemment, of Brooklyn, New York.

The $100 prize for the best work on Cramer's Isochromatic plates was awarded to Elton, of Palmyra, New York.

THE ASSOCIATION PRIZES AWARDED AT BUFFALO.

The Grand Prize to J. E. & E. J. Roesch, of St. Louis.

Diploma for the second best collection to H. McMichael, of Buffalo.

Class A, Genre Pictures to H. Randall, Ann Arbor, Mich.

Diploma for second best collection to G. M. Elton, Palmyra, New York.
Class B, 1st. prize to E. F. Hall, Buffalo, N. Y.
" 2d. " P. H. Rose, Providence, R. I.
" 3d. " H. S. Bellsmith, Denver, Col.
Class C, 1st. prize to E. C. Dana, of New York.
" 2d. " Gilbert & Bacon, of Philadelphia.
" 3d. " George Steckel, Los Angeles, Cal.
Class D, Gold medal only, to J. M. Brainard, of Rome, N. Y.
Class E, 1st. prize to Miss C. E. Sears, of Boston, Mass.
" 2d. " Heimburger & Sons, New Albany, Ind.
For Marines, to H. G. Peabody, of Boston, Mass.
For Architectural Views, to C. C. Langill, of New York.
Class F, 1st. prize, to James Inglis & Co., of Rochester, N. Y.
" 2d. " Eastman & Co., " "
Class K, gold medal only, to E. P. King, Providence, R. I.
Class H., silver medal only, to G. Weinig, " "
Class I, silver medal only, to J. R. Lane, Columbus, Ohio.
Class K, Foreign Exhibits, 1st prize, to W. J. Byrne, Richmond, Surrey, Eng.
" 2d " F. Mueller, Munich, Germany.

The Committee also awarded a Special Diploma to H. P. Robinson, of Tunbridge Wells, Eng., for his collection of pictures, for which there was no prize offered. The foreign prizes being for portraits only, while the collection of Robinson was landscapes.

The prize for improvements in photographic appliances was awarded to The Automatic Printing Machine Company.

Report of Harvard College Observatory.—Prof. Pickering has just issued his report for last year. He again urges the necessity of a fire-proof building for storing the 27,000 photographic plates of spectra, 9,000 of which were taken in 1890. During the past year, 1,309 photographs of stellar spectra have been taken with the Bache telescope at the station near Closica, in Peru. Nearly all of them relate to the region south of 20 degrees. Mrs. Draper has added another instrument of the same kind to the Henry Draper Memorial. This is mounted in the Observatory grounds at Cambridge, and since September 1889, 2,157 photographs have been taken with it, covering the sky north of 20 degrees. By placing a prism of small angle over the objective, the spectra of stars as faint as the tenth magnitude have been obtained. Six stars with Type IV spectra have been discovered. Spectra of fifteen planetary nebulæ have been photographed. The hydrogen line F has been shown to be bright in eight stars. Bright line stars of the Wolf-Rayet type now number twenty-eight, three having been added to the list during the past year. The names are given of thirty variable stars of long period, in which the hydrogen lines are bright at maximum. This peculiarity has furnished a means of discovering seven new variable stars. An important accession to the white spot surrounding the southern pole was found by photographs to have occurred between the nights of April 9th and 10th.—*Nature.*

All he Knew—Mrs. Henpecque: "What do you know about women, anyhow?" Mr. H. (meekly): "Nothing, my dear, or I would be a bachelor now, perhaps."

ANTHONY'S

Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,

Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S,

and a corps of practical assistants.

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SHUCKS.

[Presented at the Buffalo Convention of the P. A. of A.]

In the dawn of this effusion
I will say right here and boldly,
That I purpose to be solemn,
What the girls call nice and stupid;
For a flitting cloud is grateful
Sometimes on these bright occasions.
We all know a picture cannot
Be all light and be effective,
But that shadows lending contrast,
By their very gloom and darkness,
Serve to give the lights their value:
So, though I am voted tiresome,
If I serve the other speakers
As a foil for their resplendence
I shall be content and happy.

Should you ask me, what in Heaven's name
Made me put this thing in meter—
Following after Hiawatha,
In the dim and misty distance—
What possessed me to imagine
That such monstrous innovation
Would find tolerance or favor
In P. A. of A. Convention,
I should answer—I should tell you
That this august, solemn body,
In Convention back some three years
Took this charming Indian idyl
As a subject to illustrate;
And that our distinguished brother,
Dwelling in southwest Ohio—
In the town of Cincinnati—
Known throughout this widespread country,
Known across the broad Atlantic—
Known to all men is James Landy—
Made such charming story pictures
Of this Song of Hiawatha
That he was proclaimed the victor,
And departed with the trophy
Offered for these illustrations:
And that ever since, whenever
We have held our yearly camp fires,
Has the ghost of these wild legends
Hovered round our solemn councils—
Lent to our deliberations
Something weird, and vague, and shadowy;
Interfering much with business:
So I thought if I could make a
Muse of this perturbed spirit,
Give it scope to have its say out,
I might lay the spook for ever.

Well, so much by way of preface.
Now, if you'll glance backward with me
To the early years of forty,
We shall find things much in this wise:
In the large towns and the cities
Of this prosperous growing country,
Up in lofts and dingy attics,
Reached by stairways dark and dirty,
Standing by an antique camera,
Clad in raiment soiled and shabby,
Might be found the picture-maker.
Glancing round the fine equipment
Of the place might thus be noted:
There were backgrounds, two in number,
A white cotton stretched on framework,
And another, dark in color.
Which came forth from grandam's dye pot;
A reflector of white cotton,
A three-legged, iron head-rest,
A round telescopic table
With a variegated cover,
To support the sitters' left arm
And lend grace to the position.
Posing chair with frayed flag bottom—
Probably a bargain purchase—
For the sum of three-and-sixpence;
And a strip of bright-hued oil-cloth
Served at once for full-length figures
And the purpose of adornment.
Round the walls there sparsely dangled
Images on polished silver—

Half the size of pocket prayer books—
Images of solemn visage,
Showing, by their awe-struck faces,
That to have their pictures taken
Was no light or frivolous matter.

By a nail and string suspended
On the street-door hung the samples,
In veneered mahogany framework,
Such as ancient looking-glasses
Had, in days before our fathers;
Samples numbering, say, a dozen,
Held in place by wooden sash-bars.
A sign also bore the legend
That in regions far above them
On the top-floor was a *gallery*.

I suppose it has sometimes happened
That some very cultured people—
People of æsthetic notions,
Such as they who dwell in Boston,
Or perchance in this fine township,
May have marveled, may have wondered
Why a name that's so pretentious—
Such resounding appellation—
Should describe a cock-loft workshop.
To such stilted, bumptious persons
I should straightway make this answer:
In the cities where the traveler
Journeys to across the water;
Such as Paris, London, Berlin,
Venice and St. Petersburg,
There are buildings grand and noble,
Filled with canvasses and marbles—
Deathless works that have survived the
Generations that produced them;
And the beautiful creations,
The great work of modern masters,
Here are found, and all united
Fill these vast and solemn spaces
With the Art of all the Ages;
And these great and rare collections
Hung within these spacious buildings
Are denominated galleries:
As for instance Gallery Louvre.
So the most exceeding fitness
Of the name we first adopted
And in fact have always clung to
Is, I trust, now made apparent.
And it may as well be mentioned
That we don't propose to drop it,
But our places still are galleries,
And till crack of doom they will be
Or at least sometime henceforward.
But if these same captious people
Should persist that such rude places
As I've just now been describing,
With their poverty of product,
Don't jog elbows with the Louvre,
Still I'm not without resources;
For I straightway should remind them
That we've pulled on up the pathway
Somewhat since the days of forty—
That a half a century's struggle
Has brought round conditions different,
And we make a better showing
From a worldly point of vision.

One by one these modest attics
Have been given back for storage,
And the primitive equipment
Now for curios brings high prices,
He who seeketh now a sitting
For a likeness made by sunlight
Need not climb the dirty stairway
Till his head grows hot and dizzy,
But a single broad, inviting
Flight of steps, perchance of marble,
Takes him up a single story,
Or an elevator lands him
At a suit of choice apartments
Of some fine and costly structure,
In some fashionable quarter;
Where, if leizure smileth on him
He can study various phases
Of the work to-day presented—
Work in plantinum and silver,
Work in carbon and on porcelain,
Work in light and shade, or color,
Work from miniatures to life size,
Busts, and half-lengths, and full figures,
With unique effects of lightning,
And variety of handling;
So the hour passed has been pleasant,
And he finds himself enlightened,
Thence within the sky-light chamber,
Where the orderly confusion
And the multitude of objects
Puzzles and distracts his fancy;
Here a battery of lenses
Are arrayed on polished boxes,
Raised or lowered by touch of finger;
Backgrounds passing over rollers
Mimic all our life's surroundings;
Here are scenes in park or garden
For the dude or pensive maiden;
Gateway by a shady cart path
Which the summer girl beguileth;
A balcony in moonlight
To help out a Juliet romance;
Libraries, drawing-rooms and boudoirs,
Plastic grounds, profiles and grass mats;
Cabinets, draperies and rugs,
Vases, flowers, *et cetera*.
This is but a slight description
Of the photographic work-shop
Found to-day in all large townships

From the mountains of New Hampshire
To the gates of the Pacific,
Not to mention the palatial
Place that Stain and Rosch have opened
In the city by the lake side
To give tone and proper eclat
To the Columbian Exposition,
And if we can't call them *galleries*
Half their glory is departed.
I must think the name's prophetic,
And that our poor struggling brother,
The despised daguerreotypist
Builded better than his knowledge
When he christened his bare attic
And through jibes and contumely
Hugged the title to his bosom;
And if still we lack the level
Where this name would be becoming,
We can say with modest firmness
That the years are all before us;
And if we keep on advancing
As we have done to the present
That the year A. D. 3000
Will have galleries that the public
Will acknowledge fit the title.

But we have another trouble
That, if anything, is graver
Than the one I've just referred to.
There are some misguided persons
Who proclaim in shrill loud voices,
And with noses high uplifted,
That we must not be called artists.
And they reason back and forward
In a tone that's half disdainful,
Showing what preposterous nonsense
It must be to grant the laurel
To the men who make their pictures
By machinery and *sich-like.*
Genius does not dwell in cameras
Say they, and the divine afflatus
Only comes to paints and brushes.
If, with downcast eyes, we mention
That the posing, and the lighting,
And accessory arrangement—
Making up the composition—
Is outside the camera's province
And perhaps, deserves some credit,
And, in fact may not be different
From a portrait painter's study:
Our stern critic points his finger
At the camera and says, *Go to.*
Then with such resentment as our
Broken spirits will admit of
We rejoin that all the asses
Are not grazing in the pastures.
Thus the controversy waxeth
Hot and hotter, and the journals
Fill their valued pages with the
Balderdash both sides have written.
Prominent 'mong our traducers
Is a cynical Professor,
Who has written much and published
In the photographic journals;
And a bull is not made fiercer
By a red flag than is this writer
When he sees the name of artist
Made to stand for our vocation
He assigns our status off-hand,
And declares our crafty purpose
Is to gain high social standing—
To get in among our betters—
And perchance to plant our banners
On the heights whereon *he* standeth.
Such temerity must not be
Let to pass, else what distinction
Can there ever be hereafter
'Twixt the artist and mechanic;
So he sits down hard upon us,
And in sneering phrase reminds us
That we are not any better
Than we ought to be, etc.,
And that outraged art flees from us
When we take the name of artist.

(*To be continued.*)

PHOTOGRAPHERS' ASSOCIATION OF AMERICA, 12th ANNUAL CONVENTION, BUFFALO, N. Y., 1891.

FIRST DAY—TUESDAY MORNING, JULY 14, 1891.

At 9 A.M., more than a quorum being present, the Convention was called to order by *President* HASTINGS, who in opening the proceedings said:

Ladies and Gentlemen, Members of the Photographers' Association of America,—I feel very proud in having been called upon to preside over your deliberations, and to call this meeting to order.

I trust that this Convention, by its liberal legislation and harmonious proceedings, will prove to be one of the most successful recorded in the annals of the Association.

I take great pleasure in introducing to you our honored member, Mr. McMichael, of Buffalo, who will make an address of welcome. (Applause.) See page 424.

The next business in order, the roll call, at the suggestion of the President was omitted, and on motion, duly seconded, the reading of the minutes of the last meeting, was also dispensed with.

The *President*—The next business I notice, is the report of Standing Committees, the

Report of the Progress of Photography, by Dr. A. H. Elliott, associate editor of Anthony's BULLETIN, will be in order.

Mr. SCANDLIN—In the unavoidable absence of Dr. Elliott, he begs to report by proxy. through myself. I must beg the indulgence of the Association, to defer this until a later date, as the report which Dr. Elliott was to have forwarded to me has not arrived by mail.

The *President*—There is also another report to be made by Dr. Elliott—that of the Committee on Permanent Home.

Mr. SCANDLIN—I would say that the same remark applies to that report as well.

The report of the Committee on the World's Fair by Dr. Elliott, will also come in under the same category.

The *President*—The report of the Committee on the Daguerre Memorial, by Mr. McMichael.

Mr. McMICHAEL—Mr. President: Probably there are some members of the Association who have not heard anything about the Daguerre Memorial. I will, therefore, just give a brief history of the record of the past two years that they may all understand the report.

At the Boston meeting, Mr. Ryder, of Cleveland, proposed that we erect a memorial to Daguerre. A resolution was passed at that time, and the Executive Committee of that year was appointed to erect a memorial, with the instruction that they should have it completed, and ready to unveil at the Washington Convention. It was a very short time to erect a suitable memorial to such a man as Daguerre, but, the Committee did the very best they could, and just at the time that the meeting was held in Washington the memorial was put up in time to be unveiled at that Convention. The memorial was unveiled and accepted by the Association with a vote of thanks; and it seemed to satisfy everybody as to its being the finest work of art that there was in Washington. We had some difficulty in raising funds, and at that time there was about $2,000 raised. There has been, up to this time about $3,300 paid on the memorial, leaving about $2,700 due. The Committee have done all that they possibly could to raise the money, but as it is, in all cases of that kind, it has been very hard work to raise money to erect a memorial to a man that is dead and gone. Mr. McMichael then presented the following report:

A. M. Collins	$20 00	paid
Geo. Eastman	16 57	"
P. A. of A.	500 00	"
J. A. Lewis	$2 00	paid
Jas. Landy	1 00	"
J. C. Somerville	10 00	"
E. K. Talcott	30 00	"
Allen Bros	3 00	"
C. W. Canfield	1 00	"
Adt & Bro	8 00	"
John Esmay	1 00	"
G. M. Carlisle	1 00	"
J. J. Faber	1 00	"
W. H. H. Clark	7 00	"
H. A. Hyatt	2 00	"
Broude Mfg. Co	9 00	"
Wilson, Hood, Cheyney & Co	8 00	"
Harry Ford	1 00	"
M. Cary Lea	10 00	"
O. P. Scott	100 00	"
Brand Bros	2 00	"
R. M. Davis	8 00	"
B. C. Cooper	1 00	"
J. M. Appleton	42 00	"
L. G. Bigelow	3 00	"
L. M. Prince & Bro	5 00	"
H. Q. Sargent	5 00	"
C. Gentile	3 00	"
Anthony's Bulletin	9 00	"
Packard Bros	5 00	"
C. W. Davis	1 00	"
G. H. Croughton	1 00	"
C. W. Motes	17 00	"
Eagle Dry Plate Co	15 00	"
O. P. Scott	10 00	"
Amateur Photographers	20 00	"
L. G. Ulman	10 00	"
Dr. Wilson	5 00	"
Buffalo Argentic Paper Co.	10 00	"
M. L. Podash	1 00	"
J. S. Cook	5 00	"
Philip Bonte	10 00	"
G. Cramer	500 00	"
C. W. Motes	10 00	"
J. E. Stenson	100 00	"
E. J. Pullman	36 75	"
Photo Times	389 00	"
Dr. Carlisle	25 00	"
E. & H. T. Anthony	500 00	"
A. M. Collins Mfg. Co.	100 00	"
F. S. Clark	1 00	"
D. P. Thompson	25 00	"
Dr. A. H. Elliott	25 00	"
E. H. Wilkinson	1 00	"
E. J. Pullman	10 00	"
A. W. Judd	5 00	"
S. L. Stein	20 00	"
W. Stuber	5 00	"
Brainard	5 00	"
Hearn	2 00	"

Edy Bros	$3 00	paid
Loney & Gable	10 00	"
W. V. Ranger	10 00	"
Photo Globe	10 00	"
J. R. Pearson	10 00	"
J. C. Edgeworth	10 00	"
G. M. Estabrook	10 00	"
E. Stanton	5 00	"
L. C. Overpeck	10 00	"
J. R. Clemons	1 00	"
S. M. Mackey	1 00	"
E. Feeger	5 00	"
Arthur Schwartz	10 00	"
Geo. Sperry	2 00	"
L. M. Jackson	1 00	"
E. Decker	5 00	"
Adam Heimberger	2 00	"
Charles E. Craven	2 00	"
F. S. Sloan	1 00	"
J. E. Smith	2 00	"
A. M. Wiggins	1 00	"
S. B. Brown	5 00	"
L. Robira	5 00	"
Benjamin Bros	5 00	"
Geo. Murphy	20 00	"
W. Noel	1 00	"
J. C. Fitzgerald	2 00	"
Jno. W. Vaughan	1 00	"
Eugene Simon	5 00	"
F. Platzer & Co	5 00	"
W. Entslen	2 00	"
E. Long	5 00	"
Miss M. G. Olcott	2 00	"
Cath. Weed Barnes	20 00	"
M. L. Potash	1 00	"
G. S. Cook	5 00	"
Brodie Mfg. Co	25 00	"
Bausch & Lomb Optical Co.	20 00	"
Geo. H. Hastings	10 00	"
	110 00	"
Sheen & Simpkinson	25 00	"
F. W. Guerin	10 00	"
Seed Dry Plate Co	100 00	"
G. Gennert	50 00	"
B. French & Co	100 00	"
Fowler & Slater	25 00	"
St. Louis & Can. Photographer	25 00	"
A. E. Reinhart	50 00	"
C. H. Codman & Co	100 00	"
Baker Art Gallery	10 00	"
Heatherington & Coover	25 00	"
Eastman & Co	50 00	"
Photo Herald	10 00	"
The Kicker	5 00	"
C. A. Schindler	1 00	"
J. Zyback	1 00	"
G. H. Newton	1 00	"

The foregoing is a list of the contributors to the memorial fund, together with the amounts subscribed.

G. M. Elton	$1 00	paid
E. H. Wilkinson	1 00	"
Welm & Becker	10 00	"
J. S. Fritzy	1 00	"
John Genzle	1 00	"
J. L. McCormick	5 00	"
Chas. Quartly	1 00	"
B. F. Pollard	1 00	"
J. L. Lovell	1 00	"
G. L. Hurd	2 00	"
Total	$3,651 32	

DISBURSEMENTS.

Stationery	$20 00
Postage	20 00
Journal	60
Cash book	40
Receipt books	31 50
Exchange	75
Wrapping paper	1 00
Express	6 00
Gelatine Plates	6 00
Photo-Gravure Co	107 56
Circulars	10 00
Telegram	35
Circulars	1 60
Postage	3 50
Printing large envelopes	3 40
Expenses attending Washington Convention	100 00
Total	$319 66

Receipts	3,331 66
Disbursements	319 66
Paid J. Scott Hartley	3,260 65
	$71 01*

STATEMENT OF DAGUERRE MONUMENT, ACCOUNT WITH J. SCOTT HARTLEY.

August and September, 1890, received payment	$2,305 65
October 12, 1890, received payment	275 00
December 12, 1890, received payment	600 00
March 14, 1891, received payment	80 00
Total	$3,260 65

* We print these figures as we received them. We do not understand what they mean.—EDITOR.

Minimum contract price.......	$6,000 00
Minimum paid...............	3,260 65
	$2,739 35
Interest on 1st and 2d notes for $700, up to July 1, 1891,	31 50
Interest on $200 paid out, and $300 due for granite........	22 50
Balance due me..............	$2,793 35

Mr. RANGER—I would call your attention to an omission in that report. It states how much is going to Mr. Hartley, but does not state what the total cost is to be.

Mr. MCMICHAEL—The contract was $6,000.

The *President*—I would say, that by a vote at the Washington meeting last year, it was decided in regard to the memorial, that after all due means had been used by the Memorial Committee to collect more money, that the Executive Committee settle the matter in full. Therefore, instead of making a draft on the Treasurer to pay for this memorial, it was decided to submit this complete report in detail at this Convention.

Mr. CABBUTT—I move that further action on this report be postponed until the next meeting, when there will be a larger attendance in all probability, so as to get a fuller expression as to what shall be done with it.

Mr. RANGER—I would add, as an amendment, that this matter be brought before the meeting on Thursday, for further action. By postponing it until then, some of the members may be disposed to make further contributions, and it would be very unkind of us not to give anybody who might wish to contribute $5 or $10, an opportunity to do so, as they might blame us in future on that account.

Mr. Ranger's amendment having been accepted and duly seconded was put to a vote and carried.

The *President*—The next on the programme is the selection of the location of the next Convention.

Mr. MCMICHAEL—In view of the fact that there is not a large attendance at this meeting, and this is an important matter, I move that we postpone action on this question until to-morrow morning's session, when a larger number of members will be present, and that this be taken up as the first thing on the programme.

The motion was seconded and carried.

The *President*—The next, in the order of business is the appointment of the Committee on Nominations. I will appoint on that Committee Messrs. W. H. H. Clark, T. H. Blair, C. W. Motes, G. Cramer and W. I. Scandlin.

The appointment of the Committee on Awards will be made this morning, and the appointments on that Committee will be kept secret until the awards have been made. Then, the names of the gentlemen who act as the Committee will be given to you.

I will now proceed to the next business before me, which is the delivery of the President's Annual Report.

(President Hastings then addressed the Convention. See page 425.)

The *President*—I wish to say that according to the new rule which we have introduced this year, the stock and art departments are not to be opened until 11 o'clock. At former meetings, it was found that previous to the opening of the sessions, people would go into the hall to the stock department and commence to talk business with the different exhibitors, which not only caused much trouble, but created a great deal of ill feeling in making those exhibitors and buyers stop their transactions and talking. A difficulty was also found in calling the meetings to order. We hope that by starting at 9 o'clock this year and finishing as early as 11 o'clock, before the heat of the day prevails, to enable the dealers to have an uninterrupted opportunity for conversation with buyers, and to afford ample opportunity for sight-seeing in the stock department.

On motion, the Convention here adjourned until Wednesday morning at 9 o'clock.

WEDNESDAY MORNING—SECOND DAY.

July 15, 1891.

The Convention was called to order by *President* HASTINGS at 9 A.M.

The Secretary read the following communications:

ATLANTA, GA., July 15, 1891.

GEORGE H. HASTINGS,

President Photographers' Association of America:

Exposition Building.

Greetings from the South,—I sincerely regret I cannot be with you. I hope it may be the grandest meeting in the history of the Association. I am with you in heart.

Fraternally,

C. W. MOTES.

DAYTON, O., July 14, 1891.

GEORGE H. HASTINGS,

President Photographers' Association of America:

Very much we regret our enforced absence but, as at all times, are with you in heart and

spirit. May wisdom guide and success attend your deliberations. Extend our humble yet hearty greetings to all, and vote us for Detroit.

Fraternally yours,

APPLETON.

The Secretary read the following report of the Committee on Nominations:

President, S. L. Stein, Milwaukee, Wis.; Vice-President, C. T. Stuart, Hartford, Conn.; Second Vice-President, — Morris, Pittsburgh, Pa.; Secretary, L. C. Overpeck, Hamilton, O.; Treasurer, G. M. Carlisle, Washington, D. C. Committee—W. H. H. Clark, G. Cramer, E. R. King, T. H. Blair, W. I. Scandlin.

The President announced that the election of officers would take place during Thursday morning's session.

In consequence of the absence of the Chairman, the reports of special committees were passed.

The *President*—I have been requested by Messrs. Anthony & Co. to appoint for them, outside of the Association, a committee to judge of their awards or prizes, and will appoint as such committee Messrs. Decker, Entrekin and Sperry.

Mr. CLARK—Under the head of new business, we have here with us a delegate from the Iowa Convention. The Iowa Association is a progressive and growing one, and at their last Convention they elected delegates to attend the National Convention, and the delegate that is present at this meeting is a lady, a progressive and successful photographer; and as she may have a little diffidence in reporting herself as a delegate, I think it may be well, perhaps, for the Association to give her requisite recognition and give encouragement to the State Association. Mrs. L. A. Schooley, of Indianola, Iowa, is the delegate of the Iowa Association.

The *President*—I feel sure the Convention would be glad to hear any report which Mrs. Schooley may make, and any arguments which she may bring forward. (Applause.)

Mrs. SCHOOLEY—Mr. President, our Associaton is in its infancy. I was requested to make a report from our State, where we have a very successful organization, and all the photographers of the State, I believe, have felt the benefit of it, and believe it would be a very good thing for every State to have an association. For that reason the State Association elected a delegate to represent that Association at this Convention. I have nothing further than this specially to mention.

Mr. CLARK—The President of the Ohio State Association is also in attendance.

The *President*—We shall be glad to hear from him.

Mr. LEWIS—I can hardly say as yet that we have a State organization in Ohio. That is, in a perfected sense. We organized what we call the Photographers' Association of Northwestern Ohio, about the middle of last November. We met at Lima, O., and we had some three meetings there, and concluded the better way would be to convert this Association into what we might term a State organization. We had a meeting for that purpose in April, and had a very good representation from the State, and it became necessary to change the constitution and by-laws of our organization, so a committee was appointed for that purpose. Our next meeting will be the 11th and 13th of August, at which time we expect to complete the organization, and are looking forward to a grand good time. There is a feeling among the photographers of the State, so far as I have met with them, that runs something like this: We have been working for ourselves individually too long and we have done nothing for each other. The feeling is—and I only wish it were generally so throughout the country—that we must organize. We must work down low enough to catch all those who are not in the habit of attending associations. If we can get them into a small form of association, then we can get them into a larger one, and finally into an organization like this.

We cannot support the business unless we do that. I think everybody has had experience enough with those who are not interested in anybody but themselves, and you know how that has come about. We must get together now. That is the way I feel about it, and the way the officers of the Ohio State Association feel about it. I only wish that every State in the United States, had an organization, for by that means we might pledge our fidelity to the Photographers' Association of America, and by that means support it. I heard some remarks since I have been here that seem to be leading up to this, that State organizations would have a tendency to more or less break down the association; but I tell you, ladies and gentlemen, it is my firm conviction that if we have a complete organization throughout the States and Territories, and go into the smaller districts, so as to get everybody into a local association, we would then be on a stronger basis than ever before.

Mr. CLARK—We also have the President of

of the Photographers' Association of Canada with us, Mr. Cochran, but he is not present at this session.

The *President*—I will call upon Mr. Scandlin to report by proxy on the progress of photography for Dr. Elliott..

Mr. SCANDLIN—That, and the other report, expected from Dr. Elliott, have not yet arrived.

Mr. RANGER—In seconding the thought expressed by the gentleman from Ohio, who spoke about getting down to the basis where all could join, which is in touch with the ideas of many who have come to this Convention, I would state that it has been thought by some of us that we are charging too large an initiation fee for membership in this Association. The question is whether it would not be better for our interests as an association to have everybody come, by having a lower rate, or have the rate so high that only a few come. If we go back to the history of the last two or three years, to say the least, we do not find it encouraging. We went to Boston to hold the Convention, because there are a great many photographers in New England. It was thought by going there all would become members—or the majority of them—but when we got there, they didn't become members, because our rates were so high. They thought they could not afford $5 to attend one meeting. We went to Washington, and it was thought there we could get a great many Southern members, but they didn't come. And we find as years go by that instead of growing, our membership is decreasing. We are on the eve of being without funds to pay the debts which this Association owes, and we have not got a dollar. We have got to do something to increase our membership, so that we can get together and become acquainted with each other, and want the rates so low that any one can feel that he can afford to join this Association. It does no good to have our rate fixed at $5 if everybody stays out. It is better to have a lower rate of $1 or $2, and get a large membership, than to charge more and get nothing.

We cannot run this Association without money, and we have got to curtail our expenses in some form, and secure a larger membership, or else we have nothing to maintain ourselves with, and that is the great question now before us. We will have to face it sooner or later. I simply offer these thoughts and hope they will bring up a discussion and expression of the views of the different people here, to see if we cannot get to a point where we can induce a majority of the photographers to become members of this Association. We can curtail our expenses in different ways. There are officers of this Association who work hard for nothing while others get paid. Now, if we were bankrupt financially this could not be done. It costs money to run this Association. The Secretary's office, the Treasurer's office, and the compensation can be reduced for a year or two, more or less, until we can get in a position where we can feel independent. I offer these expressions of opinion hoping to bring out the views of other members. (Applause.)

Mr MCMICHAEL—The old cry seems to be on still. When business gets dull, cut the rates. They say that that makes business. Now, I don't see that it is going to make any business for this Association to cut the rates, to reduce the rates to $1 or $2 won't make any difference in a man's expenses while attending. His great expense is his railroad fare, his hotel bills, and such things as that, and you won't get any more people to the Conventions by making the rate fifty cents or $2 than you do at the present time. If it is worth anything at all to a man to attend these Conventions it is worth $5. I never got through for $5 or $50 at any one Convention, and I am not sorry I ever attended any Convention. I think you can reduce the officers' salaries in a great many ways. Possibly you might reduce them to what they were originally, that is, five per cent to the officers who do most of the work. When I was secretary of the Association we had five per cent. and paid our expenses out of that, but the officers never got anything except their expenses, because what they received was just about enough to cover that, and for three or four years that I have been in the Association working for it I have never received $1 above my expenses. Now, I think that any one else can do the work in the same manner, and I think that that is all they are entitled to. If they get the honor of the office and enough to pay their expenses, that is all they should be given. But in order to do this and accomplish what Mr. Ranger suggests, we will be obliged to change the constitution and by-laws, and to do that it will take a two-thirds vote. I do not see how we can do anything of the kind at present.

Mr RANGER—I would say in answer to Mr. McMichael that it is all very well to say that it is worth $5 to attend a Convention, but the facts remains that the people do not come. If they do not come here and pay the $5, what good are they outside? We do not get their

dues or anything else. I know of a certain photographer in this State, who attended this Convention, and when he found he had to pay $5 he would not join, He was willing to pay $2 or $3, but would not pay $5. And another point: in the old days, when the dues were only $2 we had a larger attendance than we have ever had at any one of these Conventions. We had a larger attendance everywhere we went. It is not a question of what it is worth to us, but a question of getting them here.

Mr. McMichael – What has become of the old association to which they paid the $2 dues?

Mr. Ranger—Gone just where we are going. (Laughter.)

Mrs. Schooley—I quite agree with Mr. McMichael, that it is not the $5 that keeps the people away. I think it is a lack of interest from some cause or another. To supply that interest is what we need to discuss at present, and not the amount of fees. Those of us who have State organizations feel that to some extent we are trying to supply that interest because when delegates are elected by the State associations to represent them at this Convention they feel it a duty to attend, and not simply a matter of personal interest. We must lay all selfishness aside. It is not because we care for the good we obtain for ourselves by attending the Conventions, but the duty we owe to the whole State associations of which we are members, and for that reason we advocate State associations. (Applause.)

Mr. Heine—I have to coincide with Mr. McMichael in regard to the initiation fee. I do not think it would make a particle of difference whether people paid $5 or $2. It doesn't keep them away, and I don't think it would make a difference in the attendance. The main expenses, as Mr. McMichael says, are the hotel bills and incidental expenses. I think myself the trouble is that we hold our meetings too often. I think once a year is too frequent. I think the movement on foot to have each State organize a State association and then say every two or three years have a National Convention making the State associations subordinate to the national body is an excellent idea. Now, one year is a very short time, and it makes it very hard for the dealers and those who exhibit every year to get up displays, and I really think without wanting to discourage the efforts of the officers that it would be advantageous to have the meetings every two years. (Applause.)

The *President*—Of course, it is well understood that the $5 fee means only the initiation, and that the expense is only $2 after the first year.

Mr. Ranger—There are many photographers who live within a hundred miles of Buffalo, and I think I am in touch with as many ot them as any one. Of course, there are those who come here and pay the $5. Mr. Heine comes from Omaha and he doesn't mind it, but these are not the people we are after. Those outside are the ones we want. Those inside are all right. I have heard many of them say when I asked the question: "Do you intend to come to the Convention?" "I guess not, you charge too much. Now, I would like to go to the Convention this year, and would be willing to pay, but $5 is too much. Next year it may be in the West where I couldn't go if I wanted to. I would go this year but cannot pay $5." And so long as they do not pay it, and our experience at other conventions has been that, what is the use of sticking to it. We want members and want every photographer to join this Association. It would be better for us and for them to do so, but unless we can make some arrangement and do something to—

Mrs. Schooley—I would like to ask Mr. Ranger whether the photographers who live in the East are less able to pay their way to the West than those in the West to pay their way East?

Mr. Ranger—Some ot them can. The question, however, is that those who become members are all right, but those who are not members we want to get in. We have come to this idea and stick to it as to the $5 fee, but at the same time our membership for the last five years has been growing less.

Mr. Cundill—I want to say that a photographer who can pay his car fare to Boston from Iowa, who can pay his car fare to Washington from Iowa, to Buffalo from Iowa can afford to pay $5 initiation fee or $2 dues. I think that the dues are only a small part of the expense. I represent that class of photographers known as country photographers. I forget how many hundreds of us there was at Milwaukee—there are very few of us here compared with that. I think if some arrangement could be made to induce that class of photographers to come to the Convention there would be plenty of money in the treasury. They are the class of men who filled up the treasury when it was full, and if you can do something to stir them up and get them out, I think everything will go on all right. Now, then remember in regard to the State Association, that if we can have those State Associa-

tions meet the alternate year and then the National Association meet every two years; that is, have one one year and another the next, I think in that way we can come. I cannot attend the Iowa meeting on account of coming here, although I would like to attend both, for as soon as I get home I have to attend to business, and cannot go to the State Association. By holding meetings as I have suggested, I think that we would get more together and do more business, and do more good for the general run of photographers—not for a few of the way-up fellows, but the downtown fellows, as it were. (Applause)

Mr. BATTLES—Here is an idea in connection with this matter. I think it is all very well to pay a $5 initiation fee, which makes the payer a member of this national organization, but I think the point with many is this, if that member misses a year he has lost his membership in the Association. There is no regulation for paying dues except by attending the Association. Now, that is my case. From 1881, I attended every convention until within the last two or three years. Circumstances over which I had no control have kept me away—not the money—but when I come here, I am asked for $5 as though I had never been a member or attended a meeting. I care nothing for the money, but I know there are many who have been members and feel an interest in the Association, but who when they have missed a term keep away because they say they do not want to pay $5, just the same as a new member.

Mr. MCMICHAEL—I wish to make a motion, which I think will settle the whole question. I move that the next convention be held in Chicago in 1893. (Applause.) I think one of the principal reasons why we are having such a small attendance at our Conventions is because we meet too often and the members that are in the habit of attending the Conventions every year get tired of them. You will see that by the great number of old members who have dropped off gradually every year. Nearly all of the older faces we do not see at this Convention that we saw at the meeting held in 1885, and I think it is becoming a burden on the photographers to get their exhibits ready and prepare them in such a short time. They cannot make exhibits worthy of the Association, and there is no reason why we should not hold conventions every two years. The dealers themselves are getting tired of it and that is one of the great sources of our income. I believe we could have better conventions and a larger attendance by holding conventions every two years, and I think now is the time to settle it. Elect the officers for 1893 and have no more dues than if it were just the same as before, and the Convention were to be held next year. There would be no expense next year and no dues. Then you can carry on the Association in the same manner as we are doing now and the dealers would make the greatest display they ever made and no doubt photographers would make the best exhibition they have ever had the chance to do. They would have two years to get up their exhibit and that is a very short time. I find every year in making exhibits a man cannot do it justice if he has any business. I think if we met in 1893, our next Convention would be the greatest ever held in the world.

The *President*—The Constitution reads, "Annual meetings." I think if a motion were made to change this to two years there would have to be a change in the By-Laws.

Mr. MCMICHAEL—If this motion is carried, we can change the By-Laws to-day or to-morrow.

The *President*—Notice to that effect would have to be given one session prior to voting on it.

Mr. MCMICHAEL—I can do that to-morrow.

Mr. CARBUTT—I think this matter could be got over by adjourning this Convention until 1893, instead of closing in the usual way.

Mr. RANGER—I hardly think that would be parliamentary and cover the ground. "Annually" does not mean two years.

The *President*—Article V. of the Constitution says: "The Constitution may be altered or amended by a vote of three-fourths of the members present at any regular meeting, and notice to alter or amend the same shall be given at least one sitting before a vote thereon."

Mr. RANGER—I would suggest that if we are going to change the By-Laws, that we have an amendment come up, say to-morrow, which will conform to the Constitution, and appoint a Committee to make two or three other changes in regard to the compensation of the Secretary and Treasurer as another thing, so as to reduce the expense. Let us all be together. We have no money when this sesssion is through with if we pay all our debts.

Mr. MCMICHAEL—Cannot we make this an adjourned meeting and meet this afternoon and settle the question and give notice of it now.

The *President*—I would say so, if you offer an amendment now, and act on it this afternoon. There has been no amendment made. There is a motion before the house to hold the next Convention in two years' time, and the Chair ruled you would have to offer an amendment, which would have to be done one session prior to the voting thereon.

Mr. McMichael—I would offer an amendment that we change the Constitution and By-Laws at an adjourned meeting from this afternoon.

Mr. Bowersox—I understand there is a committee appointed on the Permanent Home. Why not hear from that committee first?

The *President*—The committee is not ready to appoint.

Mr. McMichael—I withdraw that original motion, and make a motion that we change the Constitution and By-Laws to suit it, and have an adjourned meeting this afternoon to settle the question.

The *President*—Do I understand you offer an amendment to the Constitution?

Mr. McMichael—I give notice of the amendment now. I will also embody in that motion a clause that the *President* appoint a commtitee to draw up those changes in the Constitution and By-Laws.

The motion was seconded.

The *President*—There is a motion made and seconded that this Constitution be amended, which will require a three-fourths vote by all present, which we will act upon this afternoon. It will now be put to a vote.

The motion was carried.

The *President*—Mr. McMichael suggested that a committee be appointed to draft the changes in the By-Laws to be presented at this Convention. I will appoint on that committee Messrs. McMichael, Cramer and Overpeck. The selection of the location for the next Convention, which was postponed for further action yesterday, will now be taken up.

Mr. Bush—I move that the selection of the location for the next place of meeting be postponed until after the decision as to the proposition made by Mr. McMichael a moment ago, be submitted.

The motion was seconded and carried.

Mr. McMichael—I have a motion which I would like to present to the Convention, with reference to the awarding of the prizes. I would move that the names of the judges be announced at this meeting as they are chosen —and I suppose they are—and that the results of their markings in detail be announced to the Association instead of, as before, simply announcing the names of the winners.

The motion was seconded.

The *President*—The Executive this year thought it would be policy to make the selection of the judges, the exhibitors and all as secret as we could, so that there might not be any partiality shown, and I have so arranged that the exhibits can be known by number only until after the awards have been made, and the judges' names are to be given to the meeting, but not given to them We have so arranged it, that there is no judge in any class which conflicts with his own exhibit in any way, or with any other exhibit.

(*To be continued.*)

Owing to the crowding of our pages with the reports of the Photographers Association, "What Our Friends Would Like to Know" is unavoidably left over for the next issue.

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NEGATIVE BY C. VOLNEY KING, N. Y.

HELIOTYPE PRINTING CO. BOSTON.

A GLIMPSE OF LONDON
FROM
ST. JAMES' PARK.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. AUGUST 8, 1891. No. 15.

THE EXHIBIT OF PHOTOGRAPHS AT THE BUFFALO CONVENTION.

WHILE the number of exhibits aggregated about fifty and made, in point of space covered, a fair comparison with former years, it was a noticeable fact that the quality of the work, viewed as a whole, was not equal to the average standard of the past; which may be explained, in part at least, by the fact that many of the exhibitors of the present year were new to the Convention. At the same time there were some notable exceptions, which, as individual examples, stood very high in all points that go to make photographs of the very highest quality. An important and pleasing feature of the art display this year lay in the fact that the light was uniformly good, the pictures well hung and not too far above or below the line to be prejudicial to their merits, and the building holding the entire display separate from the main exhibition building, and thus removed from the disturbing influences so prevalent on many previous occasions. Competition for the grand prize was comfined to few exhibitors, and the contest was hard fought and the victory well won. The prize itself, a beautiful bronze group, was well worthy the struggle made for it, and the winner may congratulate himself on its acquisition without feeling that its possession this year augurs that it will be easy of attainment next.

In genre work some excellent pieces were shown, and, no doubt, they will suggest ideas for elaboration and prove a benefit to many who were so fortunate as to see them. The collection in this class was not large, but was of such a character as to draw warm praise from all.

H. Randall, of Ann Arbor, Mich., was represented by a number of subjects of interest and showing a great deal of hard work and earnest thought. One, a group of children perched on a fence, being particularly good in posing and arrangement, and, in fact, in treatment throughout. Mr. Randall's larger work was strong and well handled, and some of his studies of antique, notably "Grecian

Muse," were highly commendable. "The Choir," is another which called forth many enconiums.

Mr. G. M. Elton, of Palmyra, was as usual represented by a strong showing, the composition in his work standing out pre-eminently, his treatment of home-life and the characteristics of rural scenes ranking him high among his competitors. We do not know that any one of his conceptions was more striking than another, unless we except the study of the old country woman seated before the farm porch absorbed in meditation. The accessories and entire handling of the picture were harmonious, and the model was evidently infused with the spirit of the subject.

In the grand prize class the number of entries was only four, but the work was of an exceptionally good quality throughout. In the group which took the first prize, by J. E. & E. J. Roesch, of St. Louis, there was noticeable a most artistic delicacy of feeling in the choice of subject, and what seemed to be a remarkable and very unusual amount of reciprocity in the several models, to the sentiment they were called upon to illustrate. The posing and accessories were not alone to be held responsible for success or failure, as in every detail the expression of the individuals themselves was full of intensely deep interest and thorough acquaintance with the story of Elaine. And we think the artists have much to lay to the door of those who so ably and feelingly seconded their efforts. That they were people of culture and refinement we believe was patent, as were those in most if not all cases in the competing pictures, and we feel that the fraternity are under deep obligations to those who are willing to aid by the use of their ideas and personalties such works as this which cannot but help to elevate art and help to keep alive that keen competition which is the one large element of success.

In the collection by Mr. McMichael, of Buffalo, which took a diploma, the work of the true artist was clearly visible, but the subjects either did not know the story as well as did he, or they were unable to merge themselves wholly into the characters they personated. The lightings, posing and accessories were full of feeling, but the soul of the story was missing. The same may be said of the two who were not so fortunate, as in each of the four cases the composition shows long hard study and careful thought; but the failure came, where it so often comes, in the inability of the artist to infuse into his sitters the thought and inspiration with which he himself may be full, and without which the embodiment of his idea is liable to become weak and vapid; the artist of the brush and of the camera differ here most widely, in that the one is dependent upon himself and the other upon his sitter. The pictures of this class were very carefully examined and great interest manifested in them by all, and as a collection they ranked high and demonstrated beyond a doubt that such contests must do much toward widening and improving the range of work that may be undertaken by members of the profession with honor and profit to themselves and great advantage to the community at large.

In Class B for the best collection of portrait photography, 14 x 17 or larger, a series of large panels and other work by E. F. Hall, of Buffalo, was especially noticeable for its generally fine qualities; posing, lighting and printing were of great technical excellence, one series of large work representing a girl selling papers, being of striking value.

In the same class, a collection exhibited by P. H. Rose, of Providence,

R. I., contained some very dainty bits of work in composition and finish, several prints of children in particular being treated with a feeling and delicacy very rare to see.

H. S. Bellsmith, of Denver, Colo., showed some strong portraits, a number of which were made very effective by printing in a circular or oval background, with the background itself printed lightly in a square. The effect of the picture was much enhanced by this treatment.

In Class C, for the best collection of portrait photography, 11 x 14 and smaller, E. C. Dana, of New York, had a fine collection of work, very prominent among which were a number of his well-known ivorettes, so delicate and soft in tone and yet so beautifully modelled and full of detail. In posing and lighting Mr. Dana's exhibition was very artistic and called forth the hearthiest enconiums from all who saw it. Mr. Dana's use of backgrounds and accessories is especially happy.

Gilbert & Bacon, of Philadelphia, were represented by a large collection of excellent prints, mostly of female figures, one a three-quarter view and another nearly profile, being very strong in treatment. If any criticism were to be passed on this collection, it would be to the effect that less retouching would have been better; but that is a point where, in our judgment, many mistakes are made. A number of platinum prints of great merit were included, which should have done much toward exemplifying the many advantages possessed by this exquisite process for the portrait photographer. To one who knows them not ignorance may be pardoned, but to him or her who saw this collection, ignorance would be but a poor excuse.

A frame which attracted much attention and occupied a prominent position from its size, was shown by George Steckel, of Los Angeles, Cal. A very strongly marked feature of this was the regularity with which the Pyramidal form of composition was used and adhered to, not only in groups of two, three or twenty, but even in single figure work.

Many of the uses to which it was applied were of great merit, but the utter absence of any other form than the Pyramid in a collection of this size was disappointing, when one considered the other good qualities contained in the exhibit.

For a collection of photographs with figures, J. M. Brainard, of Rome, N. Y., showed work which would rank high in any company. One subject, which he called "The Farmers' Friends," being particularly happy, in composition and effect, showing, as it did, a farmer in the pasture, surrounded by a large flock of sheep, which were crowding around him as if to obtain, each a share of what he might be about to distribute among them from the measure in his hand. The treatment of sky, wood and foreground was admirable.

In our next issue we shall note the other pictures, our present allotment of space is exhausted.

Drops.—The size of drops varies from various causes, of which the nature of the liquid, the size and shape of the lip of the vessel from which dropped, the extent to which the lip is moistened, and the rapidity of dropping, are the most important. This is, therefore, an uncertain mode of estimating the quantity of liquids, and should be superseded where minim measures can be had.—*American Druggist.*

EDITORIAL NOTES.

HARVARD UNIVERSITY is destined to be the center of astronomical photography. We hear that the celebrated lens makers, Alvan Clark & Sons, are at work on a new telescope specially fitted for astronomical observations through the aid of photography. The lens will be made with a view to its perfection as a photographic instrument rather than from an astronomical standpoint. The aperture of the lens is to be 24 inches, and its focal length 11 feet, making it the largest and finest instrument of the kind in the world, and three times the size of the instrument now in use at the Harvard Observatory.

IN the last issue of the *Bulletin de l'Association Belge de Photographie* we note an uncommonly fine photo-micrograph of the retinal purple made by M. Goderus of Gand. It was made with solar light, using a drop shutter and a Zeiss objective, the enlargement being 250 diameters. It is certainly one of the finest pieces of work of its kind that we have seen in a long time.

CYANINE has for a long time been used as a sensitizer for red in orthochromatic photography. The variety found in commerce is what is known as iodo-cyanine, and some kinds of it have a tendency to produce fog when mixed with the gelatino-bromide emulsion. Dr. Eder has recently shown that if the cyanine is converted into chloro-cyanine this tendency to fog is greatly lessened. The conversion may be made as follows: The powdered commercial cyanine is mixed with water and hydrochloric acid enough to cover it. This mixture is heated on a water-bath until it is dry, stirring all the time. The moistening with water and hydrochloric is repeated; also the drying. This gives the chloro-cyanine which still contains a little acid. The dried powder is now heated on a sand-bath till the edges become dark and metallic, when all the acid will have escaped. The chloric-cyanine acts like the ordinary kind, but with less fog, and it is soluble in alcohol.

A MIXTURE of equal parts of alcohol and ox-gall that has been shaken for several days in order to thoroughly unite them, is recommended as a glaze for albumen prints. A glass plate is coated with the mixture and the washed albumen print is placed upon it and kept in place under pressure. After drying for one hour it will peel off with a fine glossy surface.

Mr. W. H. RAU, of Philadelphia, is making a photographic survey of the entire system of the Pennsylvania Railroad. The railroad company has built for him a special photographic car, containing a dark room with ample water supply and all the photographic necessities, as well as sleeping and dining apartments. The work to be accomplished will be of the picturesque order, and with Mr. Rau's experience we may hope for some fine results.

THE photographers of Lancaster, Pa., have organized as the "Association of Photographers of Lancaster City and County." The officers of the Association are: President, B. Frank Saylor; Vice-President, Reinoehl Knipe; Secretary and Treasurer, H. A. Black. All the photographers of the city except one belong to the Association. Meetings are held on the second Monday of each month at the studios of the members. The members of the new organization

hope to realize much benefit from this union of interest, and we sincerely believe that they will. They are to have an outing in August, and all the studios are to be closed. It is to be known as "Photographers' Day."

THE members' badge of the Buffalo Convention was a bronze button on which was a figure of a Buffalo in relief with the letters P. A. of A. above, and 1891 below. It was artistic in design, and will be a pretty souvenir of the meeting.

AT a special meeting of the Brooklyn Academy of Photography held last month, the members of the Brooklyn Photographic Society were admitted as members of the Academy in a body.

WE are glad to note that Dr. John H. Janeway of the United States Army, formerly Vice-President of the Society of Amateur Photographers of New York, is to be stationed at Philadelphia, having been transferred from the Benicia Arsenal, California. We hope to see the doctor's pleasant face at some of our New York meetings next winter.

WE have received this year's fifth number of the *Boletin do Gremio Portuguez*, a photographic monthly published in Lisbon, in the interest of amateurs. It is evidently edited by men thoroughly versed in the science and is teeming with most varied and interesting matter and up with the times. We congratulate our Portuguese colleague.

THE first number of a new photographic monthly published in Barcelona, Spain, has reached our editorial table. Its title is *Boletin de la Sociedad Fotográfica Española*. Although a mere prospectus, it contains however four very well written articles by prominent men, on photographic lenses, aristotype paper development, and an account of the process of Professor Lippmann for reproducing the colors of the spectrum.

We wish our new colleague a long and prosperous existence, and hope it will visit us regularly.

[*From our Special Correspondent.*]

ENGLISH NOTES.

Two or three years ago a portion of Mr. W. Jerome Harrison's work on "The Literature of Photography" appeared in the pages of ANTHONY'S BULLETIN. That portion included a list of all the printed books on the subject which had been published in the British Isles. The other installment of this important work is now appearing in the *Camera Club Journal;* the section now treated of by Mr. Harrison, including "Papers on Photography, or on subjects directly connected with Photography, which have appeared in the periodicals other than those specially devoted to the Art." The series commences with Count Rumford's paper entitled "An Enquiry concerning the Chemical Properties that have been attributed to Light," which appeared in the "Philosophical Transactions" (of the Royal Society) for 1798; and it promises to include a great variety of buried lore, which once brought to the surface and rendered easy of reference will be of extreme interest. Mr. Lyonel Clark, the librarian of the

Camera Club, and a thorough student of the history and literature of photography, writes: "I am able to announce that Mr. Jerome Harrison, whose "Bibliography of Photographic Books and Periodicals" is a standard work, is now publishing in the *Camera Club Journal* the third portion of that work. This portion embraces the list of those works that have contained articles on photography. Its compilation has cost the author some years of labor, and it will be an invaluable work, which, in connection with the author's previous lists, will form not only the most comprehensive bibliography of photography ever published, but must stand as a model of what a bibliography of any science should be." I mention this subject here, because I read in the scientific papers that the American Association for the Advancement of Science has just appointed a committee to report on the subject of "The Literature of Photography," and it is possible that they may not have heard of Mr. Harrison's work.

The conflict still rages round the question: "Is Photography one of the Fine Arts?" The present defender of art from the rude attacks of the camera, is Mr. Joseph Pennell, an American, I fancy, and well-known as an illustrator of books. He has "bearded the lion in his den," and has questioned: first, at the Camera Club conference, and afterwards at their ordinary meetings, the right of photography to be anything more than the "basely mechanical." Will it be believed that Mr. Pennell can use an argument such as the following (he is discussing his assertion that a photograph cannot render the interior of a cathedral as accurately as an artist could draw it): "The President (Captain Abney) remarked that he thought photographic and artistic perspective were the same. I can assure him that they are not, and I should be glad to prove it. The expression I used that turrets and towers which I saw were not rendered by a photograph, was very carelessly worded. What I meant was, that when standing at my full height I could see certain details which were hidden to the camera placed about a foot lower than my eyes; by stooping I could see other details which the camera, being fixed, could not take in. On moving three feet to the right I would get a vista which would not be taken by the lens, two feet to the left would shut out an unpicturesque object, which would be the most prominent detail in the photograph. In fact, a good rendering of a cathedral is the most complete rendering, which may necessitate your taking half a dozen points of view and working them all into one picture (I don't mean in the photographic fashion). When a photographer can do this he will be much further advanced on the road to art than he is at present."

If this statement has any meaning at all, it is: "Sacrifice Truth to Beauty." I know a painting which is, technically speaking, of the highest quality. The artist intended to represent "Gurth the Swineherd," as he appears in the opening chapter of "Ivanhoe," feeding his pigs near Charnwood Forest. The artist painted his pigs from the grand droves which still frequent the New Forest in Hampshire. He got some magnificent rocks from Wales; while his oaks he did actually paint on Charnwood. The picture was admired by thousands; but every man of science who studied it smiled at the incongruity with which objects naturally far apart were associated with one another. But Mr. Pennell has only to put his painter in a balloon and matters can be reconciled directly. Hovering over Hampshire he can see "certain details" (spotty pigs) "which were hidden" to his eye when in its proper place (Charnwood, the scene of the story). "Moving to the left," over Wales, he gets a "vista" previously invisible. He

puts all these things down on his canvas and there you are! I can fancy the *habitué* of one of our grand cathedrals wandering uneasily about, endeavoring to find the *coup d'œil* which Mr. Pennell had sketched. "'Tis here! No, try again; two feet to the left;" now I've lost something." And he gives it up. Nothing can be more distasteful to the really educated man of the present day than to offer him a collocation of details a pot pourri of beauties; gathered by fidgeting about, and representing what the eye never saw at one and the same time. What Cromwell said, "Paint me with my wart" applies to the rest of nature as well as to man. Omit not the mine from the mountain side, nor the railway from the river. If you don't like the dirt which nature has set before you, go elsewhere; but don't try to add flavoring to her sauces! Truth before beauty!

A notable fact of the present season is the increase in the number of photographers who regularly and systematically back their plates. Among the two or threescore of out-of door workers with whom I come most frequently into contact, I should say that quite one-half now never think of using an unbacked plate; and these include all the best men.

There are two "backings" which find special favor. The first is bitumen dissolved in benzine and poured on the back of the plate. It hardens in a few minutes, and is removed by the help of a broad chisel just before development. The other is a creamy mixture of burnt umber (or burnt sienna) with gum and methylated spirit, applied with a piece of washleather and removed with a damp sponge.

Mr. Debenham has lately shown that by the use of backed plates a very greatly increased exposure may be given without harm. In fact, with backed plates such a thing as "overexposure" becomes almost unknown.

The recent arrival of "Anthony's International Annual of Photography" has given great pleasure to thousands of readers in England. This dainty volume with its exquisite illustrations, beautiful printing, and clear arrangement takes a long lead of every similar publication, for its articles are numerous, well written, by men of reputation, and accurate. Bulky matter, choice paper, wealth of pictures, all are useless unless the "printed stuff" is good; and that is just where several annuals fail miserably. The editors of "Anthony's Annual" have secured the aid of a splendid staff of contributors, and each volume which they issue makes a definite impression upon the photo world. Of course every reader of the BULLETIN possesses the four volumes of the "Annual" now issued. By the way, what a gem the colored illustration in the new "Annual" is. I am told by the dealers of scores of people who have purchased the book for that picture alone.

I see that the editor of *Photography* (who also edits *The Cyclist*, the leading organ of cycling in the world,) strongly endorses the views I recently expressed as to the advantages of combining cycling with photography. I hope shortly to give my experiences of a tour on a tricycle with a whole-plate camera over the hills and rough roads of North Wales. In the meantime, among those who are "bound to the wheel," is—

TALBOT ARCHER.

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

THE ALBUMEN PROCESS.

BY P. C. DUCHOCHOIS.

Honey	2 grams.
Ammonium iodide	0.8 gram.
Ammonium bromide	0.6 "
Iodine	0.1 "
Albumen (whites of eggs)	100 c.c.
Water, distilled	10 "

Grind together the honey, iodide, bromide and iodine with the water, add the albumen and beat the whole to a solid froth. Let settle for ten or twelve hours, then decant the clear liquid for use.

Honey is added not to increase the sensitiveness of the photo-film on which it has little action, but to prevent the crystallization of the haloid salts resulting from the desiccation of the albumen which retains no water, becomes hard and without elasticity, and then cracks forming a multitude of small fissures. Even, for this reason, we often added two drops of glycerine to the above quantity of albumen.

The glass plates should be cleaned with extra care and well dusted before coating. It may seem strange that such a direction should be given to the readers of the BULLETIN, for clean plates and no dust is a *sine quâ non* in all the photographic processes, but in this one it has still a greater importance on account of the thinness of the film and the purposes for which the process is now occasionally employed. In fact, to effectually exclude dust, the operating room should be swept, dusted, then sprinkled at least one hour before albuminizing and gelatinizing.

To coat the plates, procure a pneumatic holder, or, in lieu, a round wooden stem about 20 c.m. long by 5 or 6 c.m. in diameter, cut at one end in the form of a cup 2 c.m. deep with a rim about 1 c.m. broad. On the rim gutta-percha is melted and spread, which, for use, is softened over an alcohol lamp in order to fix the plate upon it.

The plate, being firmly fixed on one of these holders, is wetted under the tap, drained, and when still damp, one coats it twice over, in opposite directions, with the albumen solution. This done, drain well off the excess of albumen by one corner, tilt the plate to bring the albumen to the opposite corner and back without a stop to the middle of the plate, then gently roll the stem between the hands to equalize the liquid on the whole surface, and the liquid accumulated at the edges being wiped off let the plate dry spontaneously in a box made *ad hoc* into which it is placed on leveled shelves.

The plate can also be dried on an iron level stand by heating it with an alcohol lamp, care being taken not to coagulate the albumen.

Some authors advise for the same purpose an iron plate heated to not over 50 to 55 degrees C., upon which a number of plates can be dried at a time. At 65 degrees C. albumen commences to coagulate.

We compound the silver bath thus:

Silver nitrate	8 grams.
Zinc nitrate	3 "
Acetic acid, glacial	2 c.c.
Water	100 "

To sensitize, one pours in a porcelain tray longer than the albuminized plate

a certain quantity of silver solution, raises it to bring all the liquid at one end, places the plate on the upper end, then in one move lowers the dish so that the whole plate be flooded at once. In this manner stains from scums and transparent lines from stops when the plate is sensitized by dipping are avoided.

From twenty to thirty seconds are sufficient to coagulate the albumen and transform the iodide and bromide of ammonium into silver compounds.

On their removal from the silver solution the plates are washed moderately in order not to entirely eliminate the silver nitrate in excess from the photo-film ; a wash in water twice renewed, then rinsing rapidly is sufficient.

In that state the sensitive film keeps for about a week. If wanted to keep for a longer period, the washing should be done more thoroughly and a preservative flowed over the albumen just after washing and draining. The preservative known as *gum-gallic* used in the collodion dry process answers well. We compound it as follows :

Gallic acid	5 parts.
Ammonium bromide	0.1 part.
Gum arabic, best	5 parts.
White sugar	2 "
Water	480 "

Dissolve and filter before use.

The albumen photo-film is little sensitive to light, and therefore one should expose for a long time to obtain a developable image. The cause of this, which, in the old time, we thought due to the influence of the vehicle, is now easily explained by that which produces the various degrees of sensitiveness of silver bromide, that is, the different states of agglomeration into grains of the molecules of the silver haloid, which of course can occur only in a liquid and in certain circumstances, such, for example, as the cooking in the preparation of gelatine emulsions.

In a collodion film the granulation is hardly apparent, but exists, nevertheless; while in an albumen film the transformation of the alkaline haloid into a silver salt taking place in a solid substance the molecules of the new compound remain in a state of extreme division and little sensitive to the luminous influence, as shown by Stas. No granulation is visible in an albumen photo-film examined by the microscope. This explains the incomparable sharpness of the images photographed by the process, and, as above said, the necessity of very long exposure times.*

The development is effected by a physical or a chemical (alkaline) developer. The latter permits, as usual, to reduce by half at least, the time of exposure, but, owing to the thinness of the silver film, and specially to the silver iodide on which the alkaline reagent has but little action, the image remains weak and one must, consequently, continue the development with the physical developer to obtain intensity.

The chemical developer consists of:

A.

Sodium sulphite cryst	20 parts.
Pyrogallol	5 "
Potassium bromide	0.5 part.
Water	480 parts.

* Compared to gelatine plate, Sens. 20, the time of exposure is about as 120 to 1.

B.

Sodium carbonate	20 parts.
Water	480 "

or,

Ammonium sesquicarbonate	10 parts.
Water	480 "

For use, equal volumes, adding B gradually.

When the image is visible in all its parts the film is rinsed under the tap, then flowed with the following solution :

Pyrogallol	1½ part.
Citric acid	1 "
Water	480 parts,

which first neutralizes the alkalinity of the film, and when a few drops of a 5 per 100 solution of silver nitrate are added, progressively develops the image to the proper general intensity.

The diapositives are printed by contact and developed, as ordinarily, the negatives, by a physical developer compounded with gallic acid, pyrogallol, or a mixture of these two reagents.

Gallic acid gives a greenish reduction, excellent for negatives and not very objectionable for diapositives used for projections.

Pyrogallol gives ordinarily a red reduction or, occasionally, a red purple reduction. The developing solution should be acidified by citric or tartaric acid.

A mixture of gallic acid and pyrogallol gives generally a brown reduction.

These different allotropic forms of metallic silver are very curious. The red reduction is *toned* with difficulty by gold, platinum or palladium chlorides.

Gallic Acid Developer.

Calcium acetate*	3 parts.
Water	480 "
Gallic acid	to saturation (C. Laborde).

This developer is employed at the temperature of 60 degrees C.

Pyrogallol Developer.

Pyrogallol	3 parts.
Citric acid	1 part.
Water	480 parts.

Employed at the temperature of 35 to 40 degrees C.

Mixed Developer.

Gallic acid	3 parts.
Pyrogallol	1 part.
Acetic acid No. 8	30 parts.
Water	480 "

Employed at the temperature of 50 degrees C.

Heating the developer has for its object the accelerating of development in order to force the details out. It is not necessary when developing diapositives.

To develop, the plate is flowed with the selected developer which is allowed to act for a minute or so, then a little of a solution of silver nitrate, 5.100, is added, when the development proceeds regularly. The silver nitrate should be

* Calcium acetate acts as an accelerator. It can be discarded when developing diapositives.

added by degrees and not much of it must be employed, for then the blacks would intensify too rapid and a harsh picture obtained.

The proofs are fixed in a solution of sodium thiosulphate (hyposulphite) at 8 or 10 per 100 of water.

The toning presents some difficulties. The process by which were toned the admirable diapositives of Ferrier, Soulé, and recently those of Mr. Lévy, is a secret which has been well kept since nearly forty years. Some operators tone by sulphuration, either by fixing in an acid bath or treating the proofs with a very diluted solution of ammonium sulphide. These processes which succeed well with collodion diapositives generally tinge yellow those on albumen films.

In our practice we operated in the following manner:

The diapositive developed and well washed is treated by a weak solution of mercuric chloride until uniformly blackened, stopping the chemical action when the reduction commences to bleach. The plate is then washed and fixed in the following solution, where the color generally assumes a bluish black:

A.

Sodium thiosulphate	8 parts.
Water	360 "

B.

Auric chloride	0.5 part.
Water	120 parts.

Mix little by little B to A, *not the reverse.*

We have now at our disposal many processes to tone before or after fixing. They are too well known by the readers of the BULLETIN to be mentioned in this paper.

ART IN PHOTOGRAPHY.

BY G. HANMER CROUGHTON.

[Read at Buffalo Convention.]

MANY years ago (it was during the *carte de visite* rage) I was painting for a firm of photographers in Dublin, Ireland. Being in the reception room one morning I heard the principal of the establishment arguing with a sitter who did not like her portraits; he was trying to convince her that the portrait must be right, because the instruments he used being the very best, it was like standing before a looking glass, and there would be as much sense in complaining about the reflection she saw in her mirror as in doing so with her portrait.

The sitter answered the photographer by a question which completely silenced him, she said: "If that is true what makes the difference between good and bad photographers."

This is my text: "What is it that makes the difference now more than then?" I answer emphatically, the presence or absence of art. The presence or absence of art, knowledge or taste in the photographer makes the difference in the photographs made in his studio, makes the difference we see in the productions exhibited year after year at the exhibition of the Photographic Association of America.

In the early days when little or no art was practiced by photographers, the public were not so exacting, because being ignorant themselves, they did not look for it; the difference consisted mostly in the chemical manipulations.

Keeping the silver bath in order, keeping that and the collodion and developer in harmony, that each should work at its best in relation to each other, kept the operator busy and left little time for the artistic.

How many times has it happened that while the operator was trying to get his sitter nicely arranged his plate would dry, and so spoil his chemical effect; is it much wonder then that the artistic gave way to the chemical? All honor to those photographers who in the wet plate days produced artistic photographs as well as good chemical effects.

Whatever the dry plate may be blamed for (and you cannot read a photographic journal without finding almost all the sins in the calendar attributed to it) there is one thing it has done for photographers, and that is, it has given them time to study for artistic effects of lighting and pose without the fear of spoiling their chemical effect, and by rapidity of exposure has enabled them to aim for expression, the soul of portraiture.

Some croakers claim that the glue plate (as the late Mr. Gregg of this city called them) has reduced photographic manipulations to a dead level, and that any "duffer" can now produce good negatives; if this is so (and I confess there is some truth in it), there is but one way to excel, and that is in the artistic.

Photographers have got to learn about art both inside and outside their studios. What I mean by that is, that photographers as a rule, even those who are known as artistic photographers, are too apt to study art through the one eye of their cameras, instead of studying it through the two eyes in their heads. They get so used to the photographic rendering of certain effects of color, light and shade, that they forget to look at them with the eyes of an outsider, and get to regard the photographic rendering as right because the lens and camera produce it so.

It would be well for every photographer who wishes to keep ahead to join some art class or school, and study art independently of photography, as well as studying those books which are devoted exclusively to art photography, and to learn to look at it from an outsider's point of view.

This advice will, I know, be particularly irksome to Americans who always want to go the quickest way to work, and who, unless they see some immediate advantage in it, will not care to try it. But, although the saying may be a chestnut, it is a sound and good one, that there is no short or royal road to knowledge, and experience must be gained by long and often irksome effort.

To see nature with the eyes of an artist, who has been trained to see her as she is, is very different to seeing it through the lens in a photographic skylight.

I have often heard photographers laugh at the efforts of artists to light a sitter in a photographic skylight, and their sneers at the failures made by them is natural enough, but it should cause thought on the part of the photographer as to the WHY ——— ?

The light in an ordinary photographic skylight is a very trying one to almost every sitter, and is the cause in nine cases out of ten of a strained or pained expression.

An artist when sitting a model to paint from uses very little light, and the effect upon the sitter is better in many ways; the pupils of the eyes are larger and the expression in repose. Let the photographer watch the lighting of the faces of his friends in an ordinary room, and if he has any discernment he will see at once the difference in the quality of the light and its influence upon the faces

and expressions; he will also note that in an ordinary room the roughness of textures is not noticed.

But get those same faces under the photographic skylight, and on account of the volume of light the pupils of the eyes contract and the eyelids close together, which causes the constant complaint that the eyes in a photograph always look smaller than in nature.

Seeing this effect in all their sitters, photographers have come to believe it is right and treat with disdain the objections of the sitters and their friends, who miss the everyday expression, and see only a new one, which they cannot account for.

Another thing which has become so familiar to photographers that they have ceased to think it a defect is the exaggeration of the skin texture.

When I was a student, the instructor of the life-class called our attention to the fine short down all over the face of the model, then taking us far enough away to lose the details of the skin texture, he pointed out how that down which we could not see gave a general soft blending of tints and shadows without getting any of the roughness of texture; he concluded by saying: "At best a microscopical study of the human mask would be an unpleasing curiosity."

Now, if would appear as if some photographers thought this unpleasant curiosity was the right thing to get, and they will not only use a rectilinear form of lens for large portraits, but will stop down till the texture of the skin in the negatives is much more like what is seen through a microscope than the human skin seen at a moderate distance. Another cause of exaggeration of texture is in the lighting. The so-called Rembrandt or edge lighting will exaggerate texture out of all truth, and when to that is added microscopic sharpness, then truth and art are shut out.

Do not think I am an advocate of out of focus fuzziness. I am opposed to extreme sharpness where that sharpness is at the sacrifice of truth to nature.

At the Convention at Boston, there was an exhibit which attracted the attention of all. I think it was from Germany, they were portraits about 11 x 14, mostly heads, printed upon mat surface paper of some kind. I saw a great deal of them and studied them with the greatest interest and profit. They were admired by all the best photographers, who attended the Convention, not one but gave them unqualified praise. They were certainly not sharply focused according to the usual photographic standard, yet they were sharp enough for pictorial standards, and their great beauty was their truthfulness to nature. The retouching upon them was only just enough to remove the spots and blemishes due to the false rendering of color by photography.

This is another abuse which has done much to bring photography under condemnation from artists, over retouching. You must do it when you make such extremely sharp negatives, particularly when you make large heads. The photographic texture is an exaggeration of the natural texture and the pencil of the retoucher must be used; and in getting rid of this exaggerated texture the retoucher makes with his pencil another which is more unreal in its mechanical smoothness than the exaggeration of extreme sharpness.

If you will use a portrait combination and do not stop down too closely, and use a diffused subdued light these exaggerations will not be seen, the retoucher's work will be much lighter, and you will have a consequent gain in truth.

From what I have seen of the new isochromatic plates they are going to make quite a revolution in both lighting and retouching. I have not used many of them, but I am quite charmed with what I have. The breaks in the gradations of the shadows caused by the false rendering of color, are absent entirely, and the retouching reduced to a minimum. The texture of the skin is softer and more truthful, and the general effect so superior that before long they must take the place of all others. One of the best firms in the city are using them exclusively, and speak in high terms of them.

I have confined my remarks to suggestions, to write exhaustively would be out of place where there are so many other things to attract your attention. But I would like to impress upon all young photographers the importance of studying art apart from photography, to be able to detect the untruthfulness of photography, for with untruthfulness there can be no true art.

Remember you are catering for a public which every day is getting more critical as art education spreads, and to keep your place you must head the procession, not follow behind.

THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES.

BY J. J. ACWORTH, PH.D., F.I.C., ETC.

(Continued.)

General Results.

For the easy comparison of the foregoing results, I have placed them in tabular forms. The numbers in the first table refer to the millimeter scale. It represents all the sensitiveness bands with their maxima, and the absorption bands with their maxima as well as for the simple stained gelatine, as also for the dyed silver bromide emulsion.

$x_1 x_2 x_3$ are sensitiveness bands under sensitiveness, and absorption bands under absorption.

$y_1 y_2 y_3$ are sensitiveness, maxima under sensitiveness, and absorption maxima under absorption.

In the second table the wave lengths are given both for the sensitiveness bands with their maxima, and also for the absorption bands, together with their maxima for the dyed emulsions.

If we compare the wave lengths of absorption-maxima and sensitiveness-maxima we find that the position of sensitiveness and absorption-maxima of the same plate do not agree; the latter are displaced toward the more refrangible part of the spectrum.

The following facts are to be noted:

First.—In a few cases the displacement is very trifling, as with aldehyde green, phloxin, bengal red and one of the cyanin bands; in other cases it is very important, as with fluorescein, fuchsin, etc.

Second.—If two sensitiveness-maxima and two absorption-maxima exist, the order of the intensity of the first may be reversed in the latter, as with cyanin, etc.

Third.—If there appear two or more absorption-maxima there may be present no corresponding sensitiveness-maxima for one or more of the same, as with iodine green, safranin, etc.

Fourth.—The displacement is very different for the different absorption and sensitiveness-maxima, as above indicated, and likewise may be for the maxima of sensitizing action of the same-dye stuff itself, as with cyanin, if it be added to the different haloid salts.

TABLE No. I.

Name of dye.	Absorption in Pure gelatine with dye.						Absorption in Gelatino-Bromide of Silver with dye.						Sensitiveness of the dyed emulsion.					
	x_1	y_1	x_2	y_2	x_3	y_3	x_1	y_1	x_2	y_2	x_3	y_3	x_1	y_1	x_2	y_2	x_3	y_3
Alkaliblue	40–59	49					42–80	60					32–47	39				
Anilinblue	40–61	50					43–85	70					43–56	51				
Safranin	53–63	59	64–80	69,5			54–63	59	63–80	69,5			45–57	51				
Anilinred	51–57	54,5					52–5	55					39–54	45				
Chrysanilin			64–83	75					54–90	75			42–48	44	52–110	70		
Aldehyd green	37–48	44	48–54	50					47–53	50					43–53	48		
Malachite green	42–48	44,5					40–50	45					39–44	41				
Iodine green	40–46	43	46–53	50			40–47	43	47–53	50					44–51	47		
Bleucoupier	40–58					50					48–52	50	30–35	33	38–42	40	43–49	46
Anilin-Safrosin	41–43?	42?	56–64	59	64–72	66	41–43?	42?	56–65	59?			38–40*	39	46–54	50		
Fuchsin	51–57	55					52–57	55					41–50	45				
Magdala red	54–61	58					54–60	57					47–57	52				
Cyanin	44–53	49	53–60	56			45–52	48	52–62	57			38–49	43	50–65	57		
Fluorescein			61–80	72					62–80	72			47–50	49	52–70	60		
Uranin			62–77	66					61–83	71			47–51	49	53–70	60		
Erythrosin			53–67	60					57–67	61	69–80	75	47–51	49	52–52	55	62.80	71
Eosin	56–64	60	68–72	70			55–65	60	66–74	70			47–58	53	66–70	68		
Bengal-Red	52–60	56	60–69	63,5			48–56	52	56–64	60			45–51	47,5	53–62	58		
Phloxin	53–57	54,5	58–66	61			47–54	50	54–66	60			45–51	48	52–59	56	61–68	65
Rhodamin	51,5–60	55,5					52–60	55,5					46–5	50				
Corallin	50–57	53	58–80	72			50†						46–60	51				
Azoblue	43–63	52					40†						35–47	39				
Chlorophyll							40–47	44					38–46	41	46–52	49	53–60	56

* Before this band lies yet another at 33–35, with the maximum at 34.
† Increases to a maximum.

TABLE No. II.

Name of dye.	Absorption in Gelatino-Bromide of Silver with dye.						Sensitiveness of dyed emulsion					
	x_1	y_1	x_2	y_2	x_3	y_3	x_1	y_1	x_2	y_2	x_3	y_3
Alkaliblue	6480–4620	5315					7604–6090	6760	6			
Anilinblue	6385–4485	4920					6385–5515	5825				
Safranin	5635–5180	5865	5180–4620	4935			6225–5465	5825				
Anilinred	5760–5865	5575					6760–5635	6225				
Chrysanilin			5635–4350	4770			6480–6025	6300	5760-3980	4920		
Aldehyd green			6090–5695	5890					6385–5695	6024		
Malachite green	6605–5890	6225					6760–6300	6582				
Iodine green	6605–6090	6385	6090–5695	5890					6300–5825	6090		
Bluecoupier					6025–5760	5890	7860–7200	7470	6867–6480	6665	6385–5960	6155
Anilin-Safrosin	6582?–6385	6480	5515–5100	5865?			6867–6650*	6705	6155–5635	5892		
Fuchsin	5760–5465	5575					6582–5892	6225				
Magdala red	5635–5315	5465					6090–5465	5760				
Cyanin	6225–5760	6025	5760–5225	5465			6867–5960	6380	5892-5100	5465		
Fluorescein			5225–4620	4860			6090–5892	5960	5760–5315	5315		
Uranin			5270–4535	4890			6090–5825	5960	5695–5315	5315		
Erythrosin			5465–5020	5270	4050–4620	4770	6090–5825	5960	5760–5060	5575	5225–4620	4850
Eosin	5575–5100	5315	5060–4800	4920			6090–5415	5693	5060–4920	4985		
Bengal-Red	6025–5515	5760	5515–5140	5315			6225–5825	6060	5695–5225	5415		
Phloxin	6090–5635	5890	5635–5060	5315			6225–5825	6025	5760–5865	5515	5270–5985	5100
Rhodamin	5760–5315	5550					6155–5635	5892				
Corallin	5892†						6155–5315	5825				
Azoblue	6605†						7200–6090	6750				
Chlorophyll	6605–6092	6300					6867–6225	6582	6155–5760	5960	5695–5315	5515

* Before this band lies yet another at 7460–7200 with the maximum at 7330.
† Increases to a maximum.

Fifth.—The experiments of Messerschmidt, Eder and others upon the positions of absorption spectra of gelatine films which were stained with dyes and the sensitiveness-maxima of similarly dyed plates can likewise be deduced as a

support for the above results. If we compare the wave-lengths, above indicated, of the absorption-maxima of the colored gelatine film alone, with the absorption-maxima of dyed gelatino bromide of silver, we find as a general rule that they not only correspond, but in most cases very nearly agree. There appears in some cases, however, as for instance with phloxin and bengal red, an important displacement, and especially by one of the bands of bengal red—in these cases, however, the dye was in close combination with silver—this must be taken into consideration.

Lastly.—The displacement of the maximum of sensitiveness in regard to the maximum of absorption has not its cause in the greater dispersion or density of silver bromide films, but finds its full explanation in the before communicated theory of Professor E. Wiedemann. (See special plate illustration.)

ILLUSTRATION OF POEMS BY PHOTOGRAPHY.

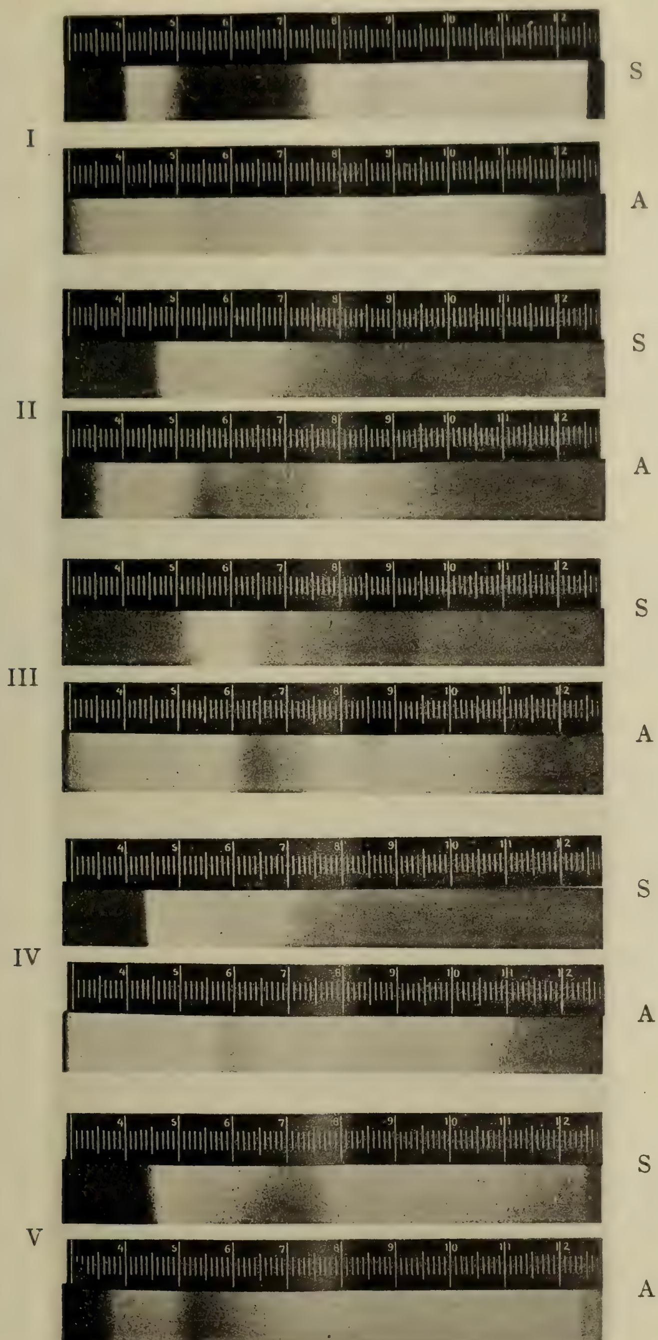
BY MISS CATHARINE WEED BARNES.

[Read at Buffalo Convention.]

Delegates to political conventions are often said to be "instructed," and so I conceive myself to have been in receiving a notification that my paper for this Convention need not be long, and should be instructive. I shall endeavor to carry out these instructions.

Let me put myself on record, to begin with, as decidedly and understandingly taking ground that the words "art" and "artistic" are no longer the private property of painters and sculptors. After several years training in painters' studios I have largely laid aside the brush for the lens, and in so doing it appeared to me as if I was only stepping from one room into another, working with different tools and under different conditions, but imbued with the same reverence for art and feeling the same inspiration. It is an undeniable fact that painters and photographers are apt to put on very defective glasses in judging each others work, and a course of mental optics would benefit both in correcting far more serious aberrations than any to be met with in a photographic lens. Where one's attention is almost entirely given to portraiture, pure and simple, much of what might be called art in photography is not required, and would not be appreciated; but photographers justify the reproach that theirs is machine work when they allow themselves to sink into such a deep groove as only to see along the narrow path before them, while experience in painters' studios ought to liberalize one's judgment of a picture, whether made by brush or lens. There is often, however, great bigotry in much so-called liberality, and it needs a steady hand to hold an even balance in judging camera work now that it is worthily claiming a higher place in the judgment of the world than any heretofore given it. Neither the scientific nor artistic qualities should be exalted beyond their proper places. The lens has limits, and it is not a brush; yet when those limits are fully understood it will be seen that they embrace wonderful possibilities of their own. But as always, when one departs from the beaten track, this means hard work, a great deal of trouble, endless patience, severe art training, and a thorough understanding of what is meant by illustrating. I conceive this last to be a pictorial translation of an author's meaning, and that anything and everything which will tend to elucidate that meaning is

PLATE ILLUSTRATING "THE RELATION BETWEEN ABSORPTION AND SENSITIVENESS OF SENSITIZED PLATES."



I—Fuchsine. II—Magdala Red. III—Uranine. IV—Erythrosine. V—Rhodamine.

S—Shows the photographic sensitiveness of colored plate.

A—Shows absorption spectrum of the same plate.

justifiable. This remark is intended, as will be seen, to cover a wide field. The faintest conception of the true art spirit ought to keep one from making his pictures the stilted, ordinary, not to be mistaken photographs. Push photographic limits as far as possible, refusing to be bound by the traditions of the portrait studio and cutting loose from whatever can suggest it. Start with the intention to have all your accessories what they claim to be, and where it is obligatory to use imitations, have them as perfect as can be made. Do not adopt the penny wise and pound foolish policy or think it always needful to go to great expense in the studio, for a little ingenuity often goes a long way in devising useful contrivances. In many cases where I have been credited with expensive appliances the same have been made with my own hands, and where unable to actually make the desired articles I have designed them after long and careful thought. It is well to settle in one's mind before taking up illustrative work whether the object or the manner of realizing it is the main point to be considered. If the latter, then, like the Irishman, stop before you begin, for you will not have enough enthusiasm to carry you over the inevitable discouragements ahead of you. Believe in and respect the dignity and beauty of the work; count no detail of the work as beneath your notice; use all the resources your taste and experience can suggest, and make everything give way to the definite purpose of obtaining a picture which will tell a story. Do not try to show the extreme limit of what can be done by a lens, but study simplicity and avoid using more figures than are absolutely necessary. An artist with whom I once studied cautioned me against introducing figures into my paintings of interiors. "No matter how good everything else may be," he said, "people will pass it by and criticise the figure." Photography and portraiture have for so long been understood as synonymous terms that it seems difficult to believe the figure is not the first thing to consider, even in an illustration. But such is not always the case, for, however effective the figure may be, the picture as a whole may often be ruined by some petty detail or incongruity. This is one reason why illustrations by photography are expensive to make when they call for correct rendering of historical costumes and surroundings. It is generally wiser to select subjects which allow simple and easily procured scenery, and which in many cases allow the work to be done out of doors even better than in the studio. Illustrations of out-door scenes ought to be made out of doors, and the light be subdued, if needful, by thin screens. As plenty of distance can be gained by this method, beautiful effects are often secured.

It is a great help to make a sketch of the intended picture and decide where the figures will be placed, as well as all the accessories, before making an exposure, and study the effect of different colors and materials. Another good plan is to arrange everything except the figures and make a preparatory exposure on the size and kind of plate and with the same lighting you expect to use. I have known otherwise fine negatives lost by neglecting this precaution, finding after development that the plate was an old one or was slower than ordinarily used in the studio. In this connection I should mention that professionals have told me they were often tempted to return to wet plates, as the dry plates, however good when fresh, could not always be relied upon and were apt to fail when it was impossible to duplicate a negative. Looking at the picture from a painter's standpoint, it must be remembered whether you are supposed to take it indoors or out, by full daylight or in the evening. Do not,

if the scene to be represented would naturally appear dark in certain parts, seek to light it evenly, but think how a painter would treat it. This may lay you open to criticism from a merely photographic point of view, but you are not making a portrait. In the great paintings of such men as Rembrandt, parts of a picture are often in dense shadow and, in a painting that would not be criticised, but the same thing in a photographic picture would, nine times out of ten, be sharply condemned. This is unjust, for lens or brush would be useless if not inspired by a skillful brain, and it does not follow that a man can arrogate to himself the name of artist simply because he uses a brush, or deny it to one who recognizes the future possible for camera work. It is always hard to live down a prejudice or a preconceived opinion, but there is a great deal of that to be done before art in photography is fairly recognized. As in a battle, the flag must be raised high over men's heads to enable it to be always in their sight, so the ideal in any line of human endeavor ought to be kept plainly before men, so that they shall continually grow and improve, and never feel that there are no more worlds to conquer; and the best thing about illustrative work is that one can never learn it all, for every victory makes a further one possible. Perhaps, and rightly enough, there is no quality more demanded in artistic photography than originality, though it is often supposed not to co-exist with technical excellence. Photographic training by itself is apt to form a stiff and artificial style, but it is not necessary, therefore, to assume that originality consists mainly of a violation of the rules of technique. The height of art is to conceal art and to do this requires a thorough knowledge of technique. Photography has only begun to show what it can do in illustrative work, and its progress should not be made any more difficult than is inevitable from the unavoidable obstacles in its path. Demand always creates supply and these obstacles will be gradually removed, but the attempts already made in this line of work should be judged by what has been done heretofore and not by what we hope to eventually accomplish. Wiseacres, the world over, may shake their heads and declare that art is being lowered by the camera seeking to displace the brush, but the inexorable logic of events is an overwhelming force, and there is no use in fighting the inevitable.

It is not the part of wisdom to ignore difficulties but to meet and overcome them, and the greatest genius must, in this work, be governed by certain fixed rules, laboring, so to speak, in harness. The poem selected for illustration should be almost learned by heart, thought of, brooded over and dreamed about until the fitting lines force themselves on one's consciousness. The famous painter, Da Vinci, was blamed by the prior of the monastery for which he painted that wonderful fresco of "The Last Supper," because he spent days in sitting before his work without touching it. But the figures and surroundings were, meanwhile, being evolved from his inner consciousness, and when he finally took up his brush no part of the picture needed correction. Let your mental vision see the picture as a complete whole before you even think of actually making an exposure. I believe, also, in testing my models in an ordinary portrait before posing them for the illustration, as sometimes an apparently good subject will prove a very poor sitter.

The exposure ought to be so nicely calculated as to leave but little work for the retoucher, but this depends largely on the sitter. It cannot be too often repeated that the retoucher should have some knowledge of facial anatomy and

realize he is to labor over an intricate network of muscles and nerves, each affecting the expression, and not over a flat surface with nothing beneath it. It might be well to have a school for training models, as it is very discouraging, after securing an effective pose or a fine printing negative, to find your sitter has moved. It is almost impossible to use headrests in work of this kind, and where 11 x 14 plates, or larger are used, expense is something to be considered. It is incomprehensible to me this utter inability of some people to face a lens, and where their nervousness or constant questions as to how they shall sit causes the loss of a good negative, it requires genuine Christian charity to "think no evil." My first unregenerate impulse is to decline the sitter's further services when, for instance, a pathetic scene is to be represented and he or she seems possessed by an insane desire to be humorous. Painters are more fortunate in this respect than photographers, as their models are usually trained and are not apt to offer advice as to how they take best, as if that had anything to do with the parts you intend them to portray. The operator who conscientiously tries to bring out the thoughts of a writer is under a keener nervous strain than the sitter can understand unless he or she is a camerist.

I have learned to have the warmest sympathy for professionals, and when I hear people say "it is so tiresome to sit for a picture," always wish to say "you don't begin to endure what the operator has to, and your work is over with the sitting; he is the one to be pitied and not you,"

The possession or lack of the true histrionic instinct of forgetting self in an assumed character is at once revealed by the model when the operator disappears under the mysterious cloth. When only the keen-eyed lens confronts the sitter, it seems, to nervous persons, as a friend once said to me, as if the aforesaid eye was gazing into one's every conscience. The average sitter, whether willing to acknowledge it or not, is intensely self-conscious, which is the true name for what they like to call nervousness. They should, for the time being, merge Miss A or Mr. B in an assumed character, and it is a discouraging truth that if they cannot do this the picture will be a failure no matter how fine the conception. Sitter and operator ought to be in perfect accord, and I do not find that there is much to choose as between men and women in sharing the above blame; one is no more self-conscious than the other. Sometimes, indeed, models are so willing to please that they wish you to arrange every finger joint or suggest to them the exact shade of expression needed, generally at the very moment you are placing the holder in the camera or drawing the slide. I do not know which is the more difficult to manage.

The operator who poses the figures and designs the pictures should have nothing to do with the petty details of filling holders, placing them, drawing slides, and moving things into position. The mere physical fatigue dampens one's enthusiasm, and it is absolutely important to have the nerves under control and not be conscious of one's body.

I have said little about technical details or studio appliances, deeming that that would, indeed, be bringing coals to Newcastle, but would like to speak of a few points which have proved practically useful to me. No illustrative work should be undertaken with any but the best lens. A Rapid Rectilinear is, generally, preferable, but a Wide-Angle is often absolutely required and, I believe, in either case, in having it able to cover a larger plate than the one used, cutting

sharp with full aperture. The studio scenery ought to be, as far as possible, in real, not simulated, relief; plastic, not painted. This allows the figures to be more naturally posed and not so apparently on a line. Most of my scenery can be taken apart and readjusted so that when used with different draperies, carpets and furniture it can form a number of combinations. With regard to the skylight, I have continuous sheets of ribbed glass, a little over an eighth of an inch thick. This is covered by five sets of white shades divided into half-yard pieces running on wires from side to side. Over these are three sets of black shades divided and run the same way. The shades on the vertical light slide up and down. I use an ordinary view camera as, with double holders, it permits more plates being ready before commencing work, and this is likely to save much time and trouble. Competition and exchange of ideas such as this present Convention, when used for the purpose of self-improvement and not mere display, ought to be of incalculable benefit, and the inspiration gained by the attrition of different minds constantly raise the standard of photographic progress. In illustrative work, amateurs and professionals, can labor side by side and each gain from the other. The former will learn to appreciate the almost infinite tact, patience and hard work demanded of a professional who, on his part, will learn that the intelligent amateur helps to elevate the work to which he himself has perhaps given the best part of his life, and thus, by mutually disseminating a wider and clearer knowledge of photography, gain for it more thorough appreciation and admiration.

OBITUARY.

E. J. PARTRIDGE.

RECENTLY we received notice of the death of Edward J. Partridge, which was briefly mentioned.

He was one of the many enterprising young men who seemed destined to become a part of the progress of the great Northwest, and intimately associated with its growth, though at the time of his death he was at his father's house in San Francisco.

For eight months he struggled to regain his failing strength, but Bright's disease had so firm a hold that he rapidly grew weaker till he passed quietly away in the early morning of June 30th.

He was born at Wheeling, W. Va., on May 18, 1856, and was educated at the Massachusetts Institute of Technology, in Boston, being a member of the class in Mechanical Engineering of '76.

His health broke during his attendance at the Institute, which he entered at sixteen years, much younger than the average student, and soon after finishing his course he was obliged to go to Florida. In 1877 he went to California with his father's family and sought to enter the field of labor for which he was so well adapted naturally and by training, but found his constitution too weak to permit. Always a lover of nature and art, he took up practical photography, which had been the lifework of his father, A. C. Partridge, at that time so well known in Virginia and Boston, and now with his son in San Francisco. In 1883 he went to Portland, Or., and opened a studio, in partnership with his brother, W. H. Partridge, who is at present following the same profession in Boston.

He became one of the best landscape and portrait photographers of the North-west. His Alaskan views are among the finest made of that region and were the first put upon the market, excepting only those made by W. H. Partridge, a year earlier—1886.

In 1888 he disposed of his cottage studio in Portland, and spent the year in the house of his brother, Samuel C. Partridge, a dealer in photo goods in San Francisco. With the following year, 1889, he opened a house of his own in Portland, at 69 Morrison street.

From his youth until the very last day of his life, he was an indefatigable worker, and that unremitting energy and ambition built up a prosperous business while it consumed the body.

His will provides for the continuation of the business, and George M. Weister, who has been with him for five years and who has had full charge during the eight months' illness of Mr. Partridge, will continue the management as before.

The personal dignity and worth of his character won for him many friends, whose earnest expressions of regret make it harder to realize, that it was best that he should lay down his life so early.

Beside his father and two brothers already mentioned, between whom and Mr. Partridge there was an unusual bond of sympathy and oneness of purpose, there are left to miss and mourn him, two sisters and an aunt, who has always lived with the family, and a lady to whom he would have been married in April last, had his health allowed.

OUR ILLUSTRATIONS.

The frontispiece of this issue of the Bulletin is from a negative made by Mr. C. Volney King, of New York. It is one of those pretty views that one is sometimes fortunate enough to catch in the City of London. The usual condition of the atmosphere is such that the view shown in our illustration is very seldom seen as perfectly as is there represented, and we must congratulate Mr. King on his good fortune as to conditions, and also on his happy selection of the point of view. The glimpse of old St. Paul's Cathedral is well seen in the distance, and the artistic effect of light and shade in the foreground makes an uncommonly pleasing picture. Our best thanks are due to Mr. King for kindly lending us the negative from which the heliotype was made.

The second plate in this issue of the Bulletin can scarcely be called artistic, but it is very useful for the comparison of the effects of the various sensitizing materials used in modern orthochromatic photography. We give it as a better kind of explanation of the excellent series of papers written by our good friend J. J. Acworth, which are completed in this issue of the Bulletin.

AWARDS FOR AIR-BRUSH PRIZES AT BUFFALO.

For the best portrait, in black and white, to W. W. Sherman, Milwaukee.
For the best portrait, in colors, to Mrs. K. L. Saunders, Alfred Centre, N. Y.

I think more of the Bulletin every year and have been reading it since 1868. No one can get along without it in photography. A. M. Bachman.

ANTHONY'S
Photographic Bulletin.
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Prof. C. F. CHANDLER, Ph.D., LL.D.,
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and a corps of practical assistants.
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EVERY ISSUE ILLUSTRATED.

SHUCKS.

BY G. L. HURD.

(*Continued.*)

Who has won her spurs by valor,
Has designed a unique title,
One so wanting in assertion
That our irascible professor
Surely can't withhold approval;
Camerist is the name she's chosen
As a proper designation
Of a person who on dry plates
Bodies forth his great conceptions.
Why she didn't say Tripodist,
Is perhaps an open question
But 'tis not polite to cavil
When a lady's in the matter;
She has surely done great service,
Throwing oil upon the water;
Now, perhaps, we'll have some leisure
To improve our work a little.

As has been remarked already,
We have pulled on up the pathway
Of improvement quite a little,
And have really got some standing.
We hold National Conventions,
And the press associations
Herald all our mighty doings
Through the cities of the country,
Even to remotest hamlets;
And reporters catch our button
To "detain us just a moment,"
As they do important persons;
And we press cigars upon them,
And intoxicating liquor,
So their vision may be clearer
When they comment on our speeches—
Just the same as do the members
In the lower house of Congress.

While photography is not hoary
Yet with age, our backward glances
Are through half a century's vista,
And already we've begun to
Mark our headlands with memorials.
Surely it was very proper
To begin at the beginning,
And to rear in bronze and granite
A reminder of our founder—
Of the great original *camerist.*
'Twas two years ago this summer
The convention was in Boston,
And the fiftieth anniversary
Of Daguerre's great discovery—
Fifty years since the first picture
That was ever made by sunlight;
And the twentieth anniversary
Of the first convention holden;
Which it may as well be stated
Was in that same proud old city—
That extravagant old township
Where the State-House dome is gilded,
And broad acres are devoted
To a common and a frog pond
In the center of the city;
Where our President abideth,
Waxing fat in fame and riches.
So, in this historic township,
When concurring anniversaries
Lent a grace to the occasion,
It was deemed a fitting moment
To bring forward the suggestion
Of a great Daguerre memorial,
And our brother out in Cleveland,
Who don't need an introduction
At my hands, I am quite certain,
He who carried off a medal
At the very first convention,
And who many a time and often
Has the same offence repeated;
And though getting fat and forty,
Or, perhaps, a little older—
Yet the boys he still can worry
When he sets himself about it;
He expounded how this matter

In his mind could be accomplished—
Carried to successful issue:
If each camerist in the country
Would take from his trousers pocket
One good, sound, almighty dollar
And bestow it toward this project
We could honor our great founder
With a monument much higher
Than the gibbet built for Hamen.
So we lost no time concurring,
And the order went out—"*forward.*"
When a twelve-month had been added
To our lives we set our faces
Toward the capital of the nation;
But the monument had hustled,
And had gotten there before us
And was on its firm foundation,
In the great Smithsonian building.

When we'd all bowed down before it
We repaired unto the chamber
Where we met in solemn conclave,
And the thing came up as business.
Then 'twas found that Brother Ryder's
Scheme had financially miscarried.
It is not within my purpose
To explain the why or wherefore;
But the goods had been delivered
And we hadn't got the ducats
To repay the needy artist.

Lowering clouds hung thick about us,
And our way seemed all uncertain
When we'd listen to the statement
Of the Chairman of Committee.

Once, 'tis said that Daniel Webster,
On convivial occasion,
When a toast had brought the statesman
On his legs, which were unsteady,
Made the national debt his subject,
And got into such deep water
That he couldn't see his way out;
Then he drew himself up proudly
And in his deep voice exclaimed
"*National debt! Why how much is it?*
Don't be worried, I will pay it."
And we thought that the Committee
Possibly might make such proffer,
But as they were less in liquor
Than the Massachusetts Statesman
Their estates seemed less extensive,
And they had far greater prudence,
So the silence was unbroken,
And the debt shut down upon us.

Then there rose an honored member,
To whose voice we always listen
With respectful, close attention,
Who has a capacious pocket,
And a brain and heart to match it—
Who don't talk to the Convention
To hear how his voice is sounding,
Neither for the sake of buncombe,
But who grasps the situation
And gets straightway down to business,
He remarked upon the credit.
This memorial had brought us,
And suggested a subscription
At this time would be in order.
"He would give five hundred dollars,
And if others figured higher
He would duplicate their figures."
Then the dealers followed quickly,
With most generous subscriptions,
Then the men who make the dry plates
Went down deep into their pockets,
And the men who make the pictures
Gave large sums with cheerful faces,
The presiding officer leading
(Though before a liberal giver)
With an even hundred dollars.
Thus the tide of wealth set quickly
Towards our great debt's liquidation,
And the gulf that yawned before us
Was bridged over in one morning.
Then we had a dedication,
A most august ceremonial.
We sent up a picked committee
To invite the nation's chieftain,
He who lives up at the White House,
To lend his official presence;
But the chief was out of spirits
(Nothing liquid is referred to),
And he had a personal grievance
Toward photographers in general.
He had lately had some pictures
Which quite failed, in his opinion,
To express the noble presence
Of the head of this great nation.
But he answered most politely
That he felt the greatest interest
In the camerists of the country;
But a previous engagement
He had made that very morning
With a baby named McKee,
Would prevent his being present,
So his Excellency was absent
From our little family party,
But the thing went boldly forward,
Forward like a dress parade.
The fine speech of presentation
By our many medaled brother,
Who was Chairman of Committee,
And the great and grand oration
By a cabinet Secretary,
With a face and form most Noble,

Who with eloquence baptized it,
Were in happiest accord.
Then the veil which had obscured it
Dropped mid thunders of applause;
And a number of fine people
Said there were no flies upon it.
The financial clouds which lingered
Still in our memorial sky
Have now been dispelled forever,
Leaving the Association
With a pocket that is empty.
Like the sphinx upon the desert
There 'twill stand through coming ages
To perpetuate the founder
Of the art of sunlight pictures,
And to fitly mark our progress
To the end of half a century.
Thither will the feet of pilgrims
Turn, when taking in the wonders
Of the capital of the nation;
Thither, too, may turn the footsteps
Of our sons, or of our grandsons,
From their legislative duties
In the spacious halls of Congress,
To refresh their jaded spirits
By a look at the bland visage
Of the now immortal Frenchman,
Whose discovery opened up the
Pathway to their father's fortune.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA, 12th ANNUAL CONVENTION, BUFFALO, N. Y., 1891.

(*Continued.*)

Mr. McMichael—I do not make this motion with any feeling of antagonism against any officer of the Association whatever, but upon general principles. It has been the experience of the Association for the past seven or eight years that the great dissatisfaction which has come from the awards of prizes is simply because everything has been kept a secret. Every man who pays a dollar into this Association has a right to all the benefits accruing from it, and if all awards are kept a secret from that man he does not know why one man receives a prize and why another does not. If we have the markings of the judges put down and given to us, every man can take his friend and go and discuss the question. But as it has been, no one can say a word about it. You cannot tell why one man receives a prize or why another did not, and I have been in competition and an exhibitor since 1885, and I have never known why prizes were given and others rejected, and I find that after six or seven years that the secrecy causes trouble.

One hundred years ago, in 1791, the Salon in Paris, the judges were obliged to give their opinions in writing as to the pictures rejected. Now, in 1891, the Photographers' Association of America makes everything a secret. Now, we have no chance in the world of learning anything from secrets. At the St. Louis Convention everything was made a secret. Nobody knew anything about it, but everybody was astonished at some of the exhibits, but nobody could solve the problem. Now, I was astonished at one exhibit in particular. There was an exhibit of female figures dressed as variety actresses. They were all made up, and they were painted and their faces represented more a map of some country on an egg shell than anything else. It did not seem to represent anything that was created in the image of its God or anything else, but the gold medal was awarded to that exhibit. An old gray-haired gentleman came along while I was looking at that. "Can you tell me why those pictures received a gold medal?" He said: "I have grown gray in photography, and nobody can tell me why those exhibits received a prize." I said: "I cannot; I don't know myself. It is one of the things that won't be revealed at any time, nor at the day of judgment." (Applause. Laughter.) Now, all these figures were composed of angles of every description, right angles and triangles. (Laughter.) There was no harmony in the posing whatever, and the photography was bad, as bad as it could be, and why it received a prize I never knew, but those pictures received a prize for first-class portraits though they didn't represent anything. There were splendid portraits exhibited there that were a thousand times better. Nobody could say why they hadn't received a prize. It was all a mystery. The markings were all made and the judges made the report, but as to their methods of deciding we know nothing about them. It was a great deal better at the Chicago Convention, for although the judges had the same exhibit to contend with they took no notice of it whatever. That was an improvement on the previous year; but still at the same time when the judges made their markings, they simply tore them up, and when their report was made no man knew why he received a prize, and why some other man did not receive a prize. Nobody knew anything about it. Some prizes were given in a very astonishing manner. I don't know why they were given, and fail to understand it still, why some prizes were given

in Chicago, and I don't blame people for kicking about something they know nothing about. Many people who have made exhibits, finding themselves cut off in this way have abandoned further efforts. We have thus lost some of our best exhibitors because they did not know whether they were to receive fair play or not.

Mr. STEIN—I will make an explanation, which I think will set matters right. After the judges have been appointed and the awards have been made, the markings are open for inspection. You cannot ask beforehand to see the markings. If you did, you could not get men to act as judges. The judges do not know who the next one is who has to decide on a certain exhibit nor the markings that will be made. The Executive Committee tries to do this thing so that it shall be fair all round, and as I have said, after the decisions are made, every one is welcome to see the markings.

Mr. MCMICHAEL—What I have said does not allude to the Executive Committee, but to the past history of the Association. At the Boston Convention we had exhibits in classes different to any we had had before, which changed the programme entirely. We chose poems to be illustrated. At the Boston Convention we had a large exhibit in that class. The men went in and judged the pictures. On the evening before the judges were allowed to post their opinions upon the exhibits. I heard one man say, about 11 o'clock at night, "I am a judge to-morrow on this subject. I must go and read up the poem for it." After men have spent about six months' time on their exhibits and studying up everything in regard to the subject, costumes, the history of the subject, etc., a man is allowed to come in who knows nothing about the poem, who says he will devote a few moments time to looking over the poem in order to judge the pictures illustrating it. How much does he know about it? (Applause.) I heard exactly the same thing at Washington, but now we come down to our present exhibit. Now, the exhibitors have probably spent the same amount of time on their exhibits. I know I have spent six months of hard study in the preparation of that one subject.

Mr. STEIN—I rise to a point of order. The gentleman is giving away the information that he is an exhibitor.

Mr. MCMICHAEL—I am not telling anything about the exhibit.

Mr. STEIN—It is unfair to the other exhibitors. I do not think that it is right either to take up such a lot of time explaining what the motion is about.

Mr. MCMICHAEL—The point I make is this: Are the men who will judge these exhibits men who have studied the poem and know the history of it? Or will they go to-night and read over the poem in order to judge pictures you have spent six months on? Let us know if they are competent to judge.

The *President*—I will now put Mr. McMichael's motion, which is that the names of the judges be given to the Convention as soon as they are fully selected.

Mr. CARBUTT—I move to amend that the names of the judges be kept from the Association until after the report has boen made to the Committee. (Seconded and carried.)

The motion presented by Mr. McMichael, that the judges names be given to the Convention as soon as selected, having been seconded, was put to a vote and lost.

Mr. FOWLER—I was very much interested in the subject of State organization, which was discussed this morning, and after this session is over, I would like to see all the Michigan photographers in this hall, and, if possible, make an effort to organize in Michigan. I hope members from other States will do the same thing.

Mr. RUSSELL—I think Mr. McMichael has two ideas in mind, when he discusses this question we have just disposed of. One is, that if he fails to get a prize, he can show what the judges say in favor of his exhibit and his ideas, and he wants to give to others who may exhibit the same privilege of showing anything to their friends which may have been in favor of the exhibit.

The *President*—You understand that the reports of the judges are open to the public after the awards are made, so that he can show them to anybody and everybody.

Mr. RUSSELL—Yes; but it seems that at previous conventions he has not been able to get hold of this, because he has been unable to see why certain exhibits were awarded prizes and others were not, which seemed of greater merit even to him, and he would like to have this made public, as far as possible, so that others may know, and it may prove of instruction to him to know why his exhibit was rejected or accepted. Again, here is a thought which I just put forth, possibly for our future guidance, which is, that Mr. McMichael has given out the idea, as I understand it, that the judges should be of a certain grade of intelligence and competent to understand what they are judging. This, at the

last moment, is possibly hard to get. A man may be intelligent on the subject and may not want to act as a judge. Wouldn't it be well, therefore, to have judges secretly, if necessary, appointed at the same time as the subject is given out, and give them the same opportunity in future to post themselves, that is, given to the men who illustrate the subject?

The *President*—It would be a most excellent idea, but if you appoint a judge at the Executive Meeting in January, when the subject is announced, you don't know that he can be present to act as a judge, and have to take the chances. We have tried to get men of intelligence and practical knowledge to judge the exhibits, and it is hard enough work to get them anyway you arrange it.

Mr. BOWERSOX—I understand these markings are to be painted on a card and put on each exhibit; or, is it merely to be kept on the desk where anybody can see it?

The *President*—The names of the exhibitors are put on their pictures after the awards have been made. The markings will be at the Secretary's desk or anywhere else that can be arranged, so that everyone can see them.

Mr. BOWERSOX—We need them on the pictures so that everyone can see them. I make a motion that they be put on.

The motion was seconded and carried.

Mr. PRINCE—There was no action taken yesterday on the President's report. We, in some way, overlooked that subject. I therefore move that the report be accepted and spread upon the minutes.

The motion was seconded and carried.

Mr. RANGER—I move that the thanks of the Association be given to Mr. McMichael for his very able address, and that the same course be followed in that case.

Motion seconded and carried.

The *President*—Mr. Gentile has some matters to bring before the Association in regard to the World's Fair which I think it would be opportune for us to now listen to.

The report of the Committee on the World's Fair has not yet arrived by mail, and there are many things about which Mr. Gentile can enlighten us.

Mr. GENTILE—The first thing we want to do in regard to the World's Fair is to make a demand on the authorities to give us a building specially adapted for an exhibit of photography. As at present arranged, we are to exhibit in the main building, in the department of the liberal arts. I think that at Philadelphia a fine building was erected for the purpose, and we ought to have one at Chicago. The best way to accomplish this, I think, is for the Association to pass a resolution requesting the directors to furnish us with a proper building. I think if that is brought before them in a proper way we can possibly get it. Already some steps have been taken in the same direction. The American Photographic Conference, at a meeting held in New York last May, passed resolutions appointing a committee to confer with the authorities and find out what they intended to do, because photography had not been classified at that time; but recently it has been classified, and it is put with the liberal arts and in with a lot of other exhibits. The only way is for us to urge on them that they give us a proper building. I will offer a resolution that this Association either appoint a committee or make such a demand on the authorities of the World's Fair as will induce them to give us a building expressly suited for our exhibits and for those of the photographers of the whole world. (Applause.)

Motion seconded and carried.

Mr. GENTILE—There is another matter in regard to the World's Fair I wish to bring before the Association, which is a matter I have been charged with officially to bring before the Association, and that is to invite you to attend the meetings arranged by the World's Fair Auxiliary. This body has charge of all the conferences to be held during the World's Fair, but is entirely a separate matter from any exhibit and has nothing whatever to do with them. The auxiliary simply has charge of the holding of conferences. There are to be conferences of painters, sculptors and photographers. We meet altogether at the opening ceremonies of that conference. Afterwards each separates and goes into its own department. The painters will form one section, the sculptors another and the photographers another. They want us to accept their invitation to attend and state when will be a favorable time to do so. These conferences of photographers will be held anyway, whether this Convention holds its meeting in Chicago or not during the World's Fair. There is to be a convention of photographers there which will be a conference of the photographers of the whole world. At the same time, they want this Association to nominate an advisory council of fifty people, composed of the most distinguished photographers of the world, and they will either communicate with or attend the conference in person. The conference will be managed in

Chicago under the President, Mr. Bonny, by a council of five, which will be appointed by him. There will be no expense attending this conference at all to this Association. You are simply invited to take this matter in hand and have this advisory council appointed, and, of course, to attend whenever it is agreed upon. It might be well for some to express their opinions as to when would be the most favorable time to hold this conference. We have to find a time suitable to the painters and sculptors as well, so you are invited to express your own opinions on the subject. I think the proper way would be to have this advisory council appointed and the President can appoint a committee to select them. We have a large list of distinguished photographers throughout the world, and it will not be difficult to name the committee. You will have all the conveniences offered you. The exhibits will either be in the building furnished or some other department. I move that a committee of three be appointed by the President to select this advisory council.

Seconded and carried.

Mr. Gentile—There is still another matter in connection with the World's Fair. The ladies of Chicago have formed a Queen Isabella Association. These remarks are addressed to the ladies in particular; it is for the ladies only. They have requested me to invite the ladies connected with photography to become members of that association. There will be two classes of membership, active and non-active associate members. Any lady connected with photography can send in her name and become a member. I think there is a fee of $1 or something attached to it. I will furnish the ladies with printed circulars in regard to it.

The *President*—Mr. Gentile has another and very interesting subject which he will probably bring before your notice to-morrow.

Mr. Carbutt—I would add a few words in addition to what Mr. Gentile has said about the World's Fair, regarding the proposed hall for photography. I doubt whether you all realize the benefit that hall of photography would be. Having had a close connection with the exhibition hall of photography at the Centennial. I would suggest to the committee that we make this demand on the authorities, when allotting this hall that all photographic exhibits of the world be put in there. At the Centennial Exhibition many of the foreign exhibits were in the foreign departments scattered through the main building, and a great many were in the exhibition hall of photography proper, which was an annex to the art gallery. Now it should be brought to bear on whoever has that matter in charge that not only photography as commonly known to all those connected with it should be there represented, but that the allied arts of photography should be exhibited. Many of you do not know what photography to-day is doing, who are simply earning your living by ordinary photography as practiced in the galleries. The wonderful results obtained by the half-tone process, for instance, which has almost driven wood engraving out of the field. Some of the finest magazines are now illustrated by the half-tone processes, obtained through photography, and photography does not begin to get the credit in this Association and in its exhibits, of what it is doing daily. The wonderful productions of paintings in monochrome by the aid of photography, too, has made great advances in the last few years, doing what used to be done at great expense by the slow and complicated engraver's stone. All this I would like to see given full credit. I therefore move that when this committee makes application that they so specify it as to induce the World's Fair authorities to arrange all exhibits connected with photography in one hall. It will be the greatest educational feature that in our day can be brought together, and those who have any love for or interest in discovery connected with the art will be educated by this means to a greater degree than by anything else. I move that this organization invite all branches of the different photographical processes, and all those interested in every branch of photography or its productions to confer with us at the next Convention.

Mr. Gentile—I forgot to mention that the art hall of the World's Fair will be one of the finest in the world. The building is to be permanently erected on the lake front in Chicago.

Mr. McMichael—I move that instead of a committee of three, that a committee of five be appointed as an advisory council to confer with the World's Fair authorities, and that this include the chief officers of the Association.

Motion seconded and carried.

The Convention then adjourned until 2.30 P.M.

Second Day.—Second Session—Wednesday Afternoon, July 15th.

The Convention was called to order, by *President* Hastings, at 2.30 P.M.

Mr. Overpeck, chairman of the committee appointed to draft the proposed changes in

the Constitution and By-Laws submitted the amendments made by the committee, embodied in the following report:

We, your committee, beg leave to submit changes in the following sections of the By-Laws and Constitution, so as to read as follows:

CONSTITUTION.

Article II.

Section 2. Any person who is eligible, may become a member of this Association by making application to the Treasurer and paying an initiation fee of $3, and bi-annual dues of $2 in advance.

Sec. 3. Employees will pay into the treasury their bi-annual dues, the sum of $2. No initiation fee shall be required.

Sec. 4. The bi annual dues become payable on January 1st of each year preceding the regular meeting, and any member failing to pay the same prior to the adjournment of such meeting shall forfeit his right to membership, and can only be reinstated on payment of an initiation fee as provided in case of admission of new members.

Sec. 5. Resignation of membership shall be made in writing to the Secretary or Treasurer. All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported at the next regular meeting.

Article III.

Section 1. The officers shall consist of a President, a first and second Vice-President, a Secretary and a Treasurer, who shall hold office two years from the first day of January following their election or until their successors are elected.

Sec. 3. The Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve on file all reports, essays and papers received by the Association, and shall be charged with the necessary foreign and scientific correspondence. He shall receive 5 per cent. of the gross receipts during his term of office as a full compensation for his services. Any moneys collected by the Secretary shall be immediately turned over to the Treasurer, taking his receipt for the same. He shall make an accurate and detailed report of the business of his office in time to be audited at the regular meeting of the Executive Committee.

Sec. 4. The Treasurer shall pay no moneys unless by order of the President and Secretary. He shall present a statement of his accounts at each regular meeting of the Executive Committee.

The Treasurer shall receive 5 per cent. of the gross receipts during his term of office as full compensation for his services.

In case of the absence of the Treasurer, he shall appoint a deputy, with power of attorney to fulfill his duties.

The Treasurer shall be required to give an indemnity bond that shall be deemed sufficient and satisfactory to members of the Executive Committee, and said bond shall remain in the custody of the President of the Association.

Article IV.

Section 3. A Committee on Progress of Photography shall be appointed by the President at the regular meeting of the Executive Committee.

BY-LAWS.

Article I.

Section 1. The bi-annual meetings shall be held at such time and place as may be determined upon by the Association.

Article III.

Section 6. A Committee to nominate officers for the ensuing term shall be appointed to report at the next morning session.

Sec. 7. The election of officers shall be held at the morning session on the day preceding the last day of the regular Convention.

Sec. 8. The first session shall close with the reading of the President's report and referring to appropriate committees any portion requiring the action of such committees.

Article V.

Section 2. In the event of a permanent vacancy in the office of President, one of the Vice-Presidents shall assume the duties of President until the next regular election.

(Signed) H. McMichael,
G. Cramer,
L. C. Overpeck,
Committee.

Mr. Carbutt made a motion, which was seconded, that the amendments be voted upon separately.

Mr. Cramer—The whole drift of these amendments is to change the annual meetings into bi-annual meetings, and where the word "annual" appears in the old Constitution it is changed into "bi-annual" or "regular meeting." Besides that there is the reduction of the salary of the Secretary and Treasurer to 5 per

cent. That is the second important point. The third point is that instead of the annual dues being $2, they will hereafter be $2 for two years. We had to change every paragraph in the Constitution wherever the word "annual" appeared, in order to make it read harmoniously if bi-annual sessions are adopted.

Mr. RANGER—Does the committee intend that 5 per cent. shall be the full compensation for the officers, and that they shall pay their own expenses the same as in former years?

Mr. CRAMER—There is a clause that has not been changed, which is that they shall be entitled to their expenses and mileage as heretofore. For their other services they are to receive 5 per cent. The balance remains as heretofore.

Mr. CARBUTT—In making my motion my idea was not to read every section separately, but only such as contain the amendments presented by the committee, and they need be only embraced in the Constitution. The balance we can vote on as one in the By-Laws. I include the reduction of salaries and the initiation fee.

Mr. Carbutt's motion was carried.

The President read Article II, Section 2, as amended, which on motion duly seconded, was adopted.

Mr. CARBUTT—This does not seem to alleviate the difficulty before complained of as to the high rates for admission into the Association. I thought there was to be an amendment that the initiation fee and dues were to be as one, $3 or $2 in one payment. I move a reconsideration of the section.

The motion having been seconded, was put to a vote and lost.

Mr. MCMICHAEL—The committee did not understand that they were to make any changes whatever, except to change the term from one year to two. The question of fees and dues was not spoken of at all as we understood it.

It was moved and seconded that a rising vote be taken to determine the sense of the Association as to a reconsideration of the adoption of the amendment, and the result being 20 ayes against 14 noes, the motion was lost.

Mr. OVERPECK—We must not lose sight of the fact that it requires a three-fourths vote.

Mr. SCANDLIN—It seems to me that the whole question hinges on whether the sessions are to be bi-annually. I would therefore move, in order to get the questions in the right order, that the section which is proposed to be amended, containing the clause relative to making the sections bi-annual, be acted upon first. If that motion prevails and the amendment is carried, then these other clauses to be amended will be simply subordinate, and will naturally take their place in the same category with the main question. If we settle the minor details first, and then the main question they all hinge upon is lost, we shall be in a bad muddle. The By-Laws will call for bi-annual dues and bi-annual assessments, and the expenses of the Association will go on annually. I therefore move that the clause relating to the change in the bi-annual or annual dues be first acted upon.

Seconded.

The question of making the sessions bi-annual, instead of annual, was then put to a vote and carried.

Mr. STEIN—I move that the changes in the Constitution and By-Laws recommended by the committee be adopted as a whole.

Motion seconded and carried.

Mr. STEIN—I understand that this morning, in my absence, I have been nominated by your committee as President of this Association for the ensuing Convention. While I appreciate the honor, I sincerely hope that they will find somebody else to fill that position. I cannot serve, as my business will not allow it. I will do all I can towards the success of the next Convention in other ways, but not as an officer.

The *President*—Mr. Stein having declined the nomination for President during the next term, the matter of finding another appointee for the position will come up to-morrow, when we act upon the other nominations.

We will now act upon the selection of the location for the Convention of 1893.

Mr. MCMICHAEL—I move that the next Convention be held in Chicago.

Motion seconded and carried.

Mr. STEIN—Being a Chicago man, I will say, in behalf of the city, that the Association is going to have a rousing reception, and its members will never have had a better time, and, I suppose having two years in which to prepare for the Convention, the exhibits will be the best that we have ever had.

Mr. PICKERILL—I ask the privilege of saying a word or two. There has been a grave mistake made here, and I know it is not intended to work any harm; but you must remember, ladies and gentlemen, photographers of America and Canada, that you do not all possibly know where Chicago is, and I am here for the purpose of telling you where

Chicago is, and I am here for the purpose of telling you how it is located. Chicago is located on the southern part of Lake Michigan. It is bounded on the north by Wisconsin and Lake Michigan, on the east by Michigan and Indiana, on the west by the great Mississippi River, on the south by the Ohio River, and located in the State of Illinois. Do you understand where it is now? (Applause). So that you will not buy your tickets to the wrong place. Being a Chicago man I feel proud, gratified and pleased that my city has taken pre-eminence over the other cities of the United States, and from the fact that it is a growing city, a city of electric lights, a city of electric cars, a city of cable cars, and we do not have to go by horse power at the rate of one and a half miles an hour. When we board a car we go right to our destination. I feel proud, as a citizen of Chicago, that the greatest meeting of this Association is to be held in the prairie city of the West. Chicago is destined to be a great commonwealth, the great city of the nation, and I hope Mr. Cramer, Mr. Seeds, and all the rest of the dry plate men, will be represented there by a large majority, and all succeed and grow up and prosper, until we have eclipsed everything that has ever been said or done in the past. (Applause.)

Mr. CRAMER—Owing to the great efforts made by the citizens of St. Louis, our city will have great festivities during the celebration and will probably have slips attached to each ticket, entitling the holder to have a trip to St. Louis gratis, to see the city.

Mr. GENTILE—We shall have annexed St. Louis by that time, so that the tickets will be good for St. Louis anyway.

On motion, it was decided that as many of the members wished to leave on Friday, that the excursion to Niagara Falls takes place at one o'clock on that day.

The *President*—I have been disappointed in some papers, those on Posing and Lighting and on Back Grounds and Accessories. Mr. Motes was expected to give a little talk this afternoon on Refining Silver Waste, showing the benefits we ought to receive from saving the waste. As he is not here, we will pass to the third on the programme for this afternoon, and listen to Miss Catharine Weed Barnes on Photographic Illustrations of Poetry. (Applause.)

I had expected a paper from our good friend whom we met at Washington last year, Professor Smiley, but have just received a letter from him, stating that on account of ill health, he is unable to keep his promise to read a paper at this Convention. The paper was to have been in reference to photography as he has to use it in very scientific researches.

Miss Catharine Weed Barnes, then read the following paper. (See next BULLETIN.)

On motion of Mr. Ranger, a vote of thanks was tendered to Miss Barnes for her able and interesting paper.

Mr. John Carbutt, read a paper on "Orthochromatic Photography." (See page 426.)

Then followed a paper by G. Hanmer Croughton. (See next BULLETIN.)

The Convention then adjourned until Thursday morning at 9 A.M.

THIRD DAY—THURSDAY, JULY 16, 1891.

The Convention was called to order by *President* HASTINGS, at 9.30 A.M.

The *President*—Mr. Gentile has a communication to present to the Association, and will do so later.

I will first call upon Mr. Scandlin to report on behalf of Dr. Elliott, on the "Progress of Photography."

Mr. Scandlin, presented and read the report. (See next BULLETIN.)

On motion, the report was accepted with the thanks of the Association, and ordered placed upon the minutes.

The *President*—Mr. Gentile is in the room, and will favor us with the communication which he has to present.

Mr. GENTILE—I have here one of Professor Lippmann's plates, which Dr. Elliott's report speaks of, and which I think will interest everybody.

One of the greatest sensations in photography during the past year has been the discoveries by Professor Lippmann, a distinguished French experimentalist in photography. We owe it to the kindness of Mr. Frank La Manna, President of the Academy of Photography of Brooklyn, N. Y., that I am enabled to present to this Association one of the two plates that have been made by Lippmann of the spectrum, which is a very remarkable feat in photography and from which some predict great results—I have no doubt that my learned friend and confrere, Dr. Arthur Elliott in his report on the "Progress of Photography" will touch on this subject.

I will read you an extract from a letter received by Mr. Harry Fowler from Professor La Manna, who has been visiting Paris, and induced Professor Lippmann to make this plate especially for exhibition at the recent American Photographic Conference. Mr. La

Manna writes: "The image of the spectrum now shown is a direct positive, and it is obtained by processes as beautifully simple as they are scientifically exact; a beam from an electric arc light (in this instance of twenty-five ampères) passed successively through a condenser, a water bath to divest it of heat rays, a direction vision prism with a slit of about two millimeters, a lens reducing the system to parallel rays, a double convex lens to reduce the image, and the spectrum is then focused for average intensity of color upon the usual ground glass."

(*To be continued.*)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the* BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—A. J. P. writes: Will you tell me how to make bust pictures so that they do not cover the plate to the edges?

A.—This is done by vignetting. If you desire the picture on a dark ground you must vignette the negative in the camera. In this case consult "Wilson's Quarter Century of Photography," page 135. If on the other hand you wish light ground, print must be vignetted. In the latter case consult the same volume, page 467. The method of working is too long to reproduce in these columns, and requires illustrations.

Q.—W. H. G. writes: I take the liberty of addressing you in regard to information which I am very desirous of obtaining. I have been using Carbutt's "Eclipse" plates for indoor exposures, and the trouble I have had is after the plate has been developed, in washing the plate the film peels of; this has happened with me several times in succession, the cause of which I am unable to find out; I hope you will inform me of the reason and a remedy.

A.—Your trouble is probably due to the use of developing solutions that are too warm. Cool the developer by placing the bottles in cold water and put some ice water into your developing dish just before using it, throwing the ice water out when you proceed to develop. Another plan, when only the edges of the plate frill, is to place the slightly washed negative into a bath of alum containing three parts of a saturated solution of alum and one part of water to which has been added a few drops of hydrochloric acid.

Q.—J. B. E. writes: Some years ago I read in your BULLETIN a formula for a developer for ferrotype plates that you said was the best you ever used. I tried it and used it for some time and I liked it very much, but have lost the recipe and would like to know if you can give me a copy of it again?

A.—We do not quite understand the particular formula that you require, but the following from Estabrooke's book on the Ferrotype is a good one:

Iron protosulphate.......	4 ounces.
Acetic acid.............	4 "
Alcohol.................	4 "
Water...................	64 "

Dissolve the iron in the water and add the acetic acid when ready to use; the alcohol need not be used if the developer flows easily without it.

Q.—T. H. C. writes: I use the "Ilford" plate and have been making my hydroquinone developer from their formula, using Anthony's c. p. hydroquinone. I have been very successful in its use, but not long ago I went to the country and exposed ten plates and on my return began developing, using developer that had been prepared a week and had given satisfaction before leaving town. To my astonishment the first plate I developed was fairly riddled with holes. As I had used great care in dusting that was not the cause. I tried two more with like experience. I then used pyro and was all right.

The formula is—

No. 1.

Hydroquinone..........	160 grains.
Bromide potassium......	30 "
Sulphite soda...........	2 ounces.
Water..................	20 "

No. 2.

Sodas hydrate..........	100 grains.
Water..................	20 ounces.

Normal developer, equal quantities of Nos. 1 and 2.

As the day was intensely hot and my room closed in my absence, could the heat, with the caustic soda, have caused the trouble?

A.—We have never had just the trouble that you speak of. But very hot weather acting on mixed developers is likely to cause them to decompose, and some such action may have been the cause of the spots that you mention.

Views Caught with the Drop Shutter.

A Strong Team—The well known photographers, Stein, of Milwaukee, and Roesch, of St. Louis, have united in opening up a studio in Chicago, which for details and perfection in all of its appointments outrivals anything in the North West.

It is located on the corner of Michigan Avenue and 13th street, and is all on the main floor except the printing department, which is up a short flight of stairs, and the toning and washing room down stairs, in a light basement being all above the street level.

All the rooms are large and airy, well adapted to the uses for which they are intended. Lighted by electricity, heated by steam and furnished with all the new and best known devices for producing work of the highest order.

The building is a three story and basement, with an L running along 13th street. It has been remodeled. The front has been embellished with the finest marble together with plate and stained glass.

This beautiful front with the skylight in full view of the wealthy people who are almost constantly passing along the avenue, makes it a striking and attractive advertisement at all times.

To go into the details of the fittings and furnishing of this establishment would require more space than can well be given here. Therefore I will only say that the furniture and the decorations show most excellent taste in their selection and indicate as well that there was plenty of money to back the enterprise.

My attention was called to some beautiful specimens of platinum prints which I was informed would be made a speciality in that establishment.

I noticed that this gallery, like all first-class establishments, is well stocked with Dallmeyer Lenses, sizes ranging from cabinet to large enough to cover a 24 inch plate. Chicago people like to see such establishments spring up and all wish that the firm may reap the reward due to such enterprise.

Rambler.

Mr. John Carbutt writes: Referring to the notice you have published regarding my exclusive right to the use of the letters A and B as trade marks on dry plates, would say that the Harvard Dry Plate Company and the G. Cramer Dry Plate Works have graciously acknowledged my title in these trade marks granted me by the United States Patent Office; and will hereafter change the designation of their respective brands.

Mr. H. Q. Sargent, of Sargent & Co., of Cleveland, O., accompanied by his daughter, sailed for Europe on July 15th, on the *City of Berlin*. He is one of the Knight Templars, 320 of whom are to parade in London by special permission obtained through Secretary Lincoln.

Mr. Edward Bausch, of the Bausch & Lamb Optical Company, sailed on the steamer *Normannie* for Hamburg on the 30th of last month. He expects to attend the Photographers' Convention which will be held at Brussels this summer, also the Triennial Celebration of the Discovery of the Microscope, which is to be held at Antwerp, beginning August 13th.

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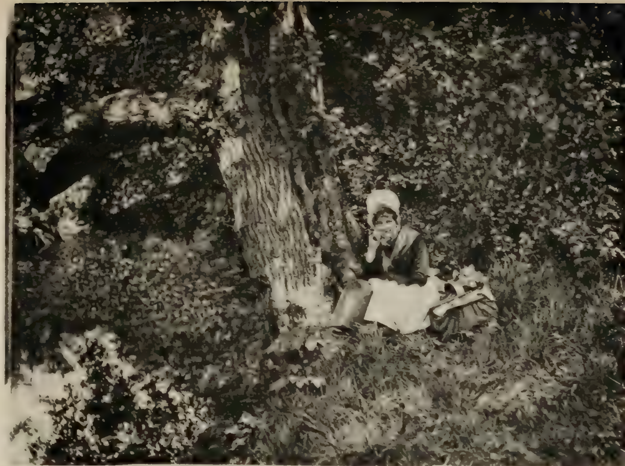

HERE THEY ARE

DOES JACK THINK OF ME?

ANTHONY'S

Photographic Bulletin.

EDITORS:

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FRILLING AND BLISTERS.

THE two plagues of the photographer in hot weather are frilling plates and blisters on his albumen prints. As the temperature has lately been somewhat elevated we have had the usual run of queries that such a state of affairs almost always brings forth.

In the matter of the first of these troubles, frilling, it is generally the novice in photography that appeals for help, or else the cry comes from one that does not think carefully about what he is doing, especially during the heated term of the summer months.

The frilling of dry plates is due to several causes. First, the plates have been made with too soft a variety of gelatine; second, the developer may be too warm, a very common source of the trouble; and thirdly, the alkali in the developer may be too strong, too caustic, or not of the right kind for the particular plate in use.

In regard to the question of the softness of the gelatine, of which the plates are made, in America this is pretty well adjusted to the climate; but some of the English plates are much too soft for our hot weather. In the United States also we sometimes come across a batch of plates, where, by some means or other the right adjustment of the gelatine has not been carefully attended to. Again, some makers of plates do not care to have the gelatine too hard, as it makes the development of the plates somewhat slow and tedious. Having a brand of plates that frill, great care must be taken that the developing and all other solutions are kept cool. This cooling also applies to the baths and dishes used in developing, fixing, etc. Ice is sometimes the only means available to keep the dishes cool. But it will be found that a little forethought in this matter may save many a choice negative that through carelessness may slip off the glass and be lost.

The character of the alkali used in the developer also has a very important effect on the frilling of the plates. Ammonia or soda does not seem to cause the

frilling of plates to such a degree as potash in the developer. But in the hard varieties of plates it is sometimes very useful to have this alkali to obtain the desired density in the negative. This is especially true of the hydroquinone developer which is most effective with potassium carbonate or hydrate.

In the case of obstinate frilling our remedy is the acid alum bath, and, in spite of all that has been said about it in some journals, we shall still rely upon it as the safest and most reliable remedy for frilling plates. The bath we use is made with three parts of a saturated solution of alum, one part of water, and to every quart of this mixture 2 ounces of acid sulphite of soda solution are added. In the event of not being able to obtain the acid sulphite, we often use 1 dram of hydrochloric acid, and this latter appears to work very nicely, although it has not the strong bleaching effect of the acid sulphite; still it is very effective against frills.

In the matter of blisters some very simple precautions are all that are necessary. In the first place, keep the albumen paper in a damp place for twenty-four hours before you wish to use it. In hot weather the albumen paper gets very hard if kept in a dry place, and during the various operations of silvering, toning and fixing, the layers of the albumen become separated by the diffusion of the liquids between them, and thus form blisters. Should the blisters appear in spite of using paper that is not hard, a very good remedy is a bath of common salt, say a handful in a quart of water. But above all things be careful that the solutions, baths, are not above 70 degrees Fahr. It is also important that the salt bath which is used between the toning and fixing is of the same temperature as the fixing bath. Of course a few degrees difference is of no importance, but a cold salt bath and a warm fixing bath will only make matters worse instead of better in the way of blisters. We believe that this remedy is always effective if it is properly applied. Using borax in the hypo bath has been recommended for the same purpose, but we have always had success with our old friend, salt, and cool solutions.

Where the blisters are filled with gas, a bath of alcohol and water in equal parts is most effective. This is also useful in the case of bromide paper when it blisters. One grain of chrome alum added to each ounce of the mixture of alcohol and water is more effective with some kinds of gelatine-coated papers.

EDITORIAL NOTES.

To those who experience difficulty in burnishing their prints, we would advise an examination of the soap used for a solution. Many kinds of soap in use in the gallery, contain more or less injurious elements of which sugar is one of the worst enemies to successful burnishing, but which is often used in one or another form to give transparency to it. Nothing is better for this purpose than the pure old fashioned castile soap.

We are pleased to note that the scheme for affiliation of the various photographic societies of England, with the Photographic Society of Great Britain, alluded to in a recent issue of the Bulletin, is rapidly taking tangible form, a committee of the latter society having been appointed and having already formulated a plan for the affiliation, which, if carried out, will doubtless prove of mutual good to all concerned and a benefit to the art all over the world.

Our good friend Mr. J. C. Hement, whose article in the International Annual has doubtless been read with much interest by most of our readers, is probably the only man who occupies the position of official photographer to two of the prominent racing associations of the country, and whose work in the direction of instantaneous photography of rapidly moving animals plays a good second to that of Mr. Edweard Muybridge. Yet he thinks the time is near when all such organizations will have their official photographer, and by his aid will entirely eliminate the well known and heartily disliked "dead heat," as he claims no such thing exists in reality.

In view of the danger attendant upon the use of chloride of lime for decolorizing old prints, in the use of which it so often happens that the print is permanently injured by incomplete washing, it is suggested that a method recently published for bleaching cotton cloth may be of advantage. The method mentioned is an immersion in a bath of oxygenated water and calcined magnesia. We shall be glad to know the results obtained with this bath, by any of our readers.

Mr. H. P. Robinson, of England, so well known by his exquisite landscape compositions, has just been elected President of the Photographic Convention of Great Britain.

A collection of prints from Mr. William A. Edmond, of Matteawan, N. Y., lately received, is quite remarkable from the beautiful tone obtained, a rich, warm brown, and for the fact that many of the negatives were made upon home-made plates. This latter is a branch of the art not often attempted by an amateur.

The *Photographic Herald* has just consumated an arrangement by which it absorbs and combines with its own publication, the *Photo-American Review*, and promises its patrons lots of good things coming, which promise, it will doubtless keep to the letter. The first issue appears this month.

We understand that Dr. W. W. J. Nicoll, of England, has very nearly succeeded in realizing his ideal, in the production of a kalitype paper which, after printing in the frame, will require only to be washed in dilute ammonia. Should he accomplish what he is striving for, it will prove a great boon to the amateur at least, from the beauty of result attainable and the simplicity accompanying its working.

An interesting print has been received from John Candee, of Syracuse, N. Y., showing the explosion of a large charge of dynamite under a lot of wreckage in deep water, in which a heavy column of water filled with *debris* is seen shooting up to a tremendous height. The negative, he writes, was made with an aristoscope lens.

It has recently been discovered that formaldehyde, or a combination of that with bisulphite salts, has a remarkable effect on negatives inasmuch as its application, either as an ingredient of the coating solution, or by bathing the plate,

either before or after exposure, tends to the same result as would be had with a long exposure. It is said to work well and to be free from all tendency to turn yellow.

Two prints of the same baby, taken within two minutes of each other, by Mr. C. C. Hillman, of Oelwein, Ohio, demonstrate emphatically how quickly a shower may come up in the atmosphere of babyhood—as in the one, nothing is to be noted in the expression save joy and happiness, while in the other—well the only solution we can suggest is that the baby was personal property of the operator and must have been undergoing a course of discipline.

Rev. George A. Fargis, S. J., assistant director of the Georgetown College Observatory, at Washington, D. C., has invented an instrument, which he calls the Photochronograph, and which he claims to be capable of registering the time of star transits, to the one-thousandth part of a second; should his instrument prove thoroughly accurate and reliable, as is believed it will, he will have the satisfaction of having taken a long stride toward the perfection of photographic records.

A number of views from different positions, of a large sandstone rock are before us, made by A. M. Bachmann, of Doylestown, Ohio, which are noticeable for their beautiful details and tones. It is a delight to review such clean, intelligent work as this; we shall expect to see more of Mr. Bachmann's work in the future.

We note that Mr. E. G. Reynolds, of Fair Haven, Vt., has been awarded a prize of $25 for the best picture of a dog, recently entered in competition with several others, in response to an offer made by a business house of this city for use as a trade mark by them.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Who is Rembrandt?—Evidence given by Photography that Rembrandt is not Rembrandt.—New Intensifying Process.—The New Paramidophenol Developer, its Chemical Composition and Properties of Isomeric Bodies.—New Formula for the Developer.

A new book, entitled "Who is Rembrandt?" has created quite an excitement during the last few weeks. The author, Dr. Lautner, informs us that most of the pictures which are ascribed to this celebrated painter (who is also known in photographic circles by a style of pictures named after him and introduced in New York, particularly by Kurtz) are not his work, but that of his scholar, Bol. Dr. Lautner proves this in a photographic way. Where with the eye and ordinary photography nothing can be seen, he discovered upon Rembrandt's paintings and also etchings at various places, where artists generally do not write their names, the name of Bol with the aid of his photographic process. As the matter was very much doubted, the "Schlesische Gesellschaft von Freunden der Photography" has investigated the question, and writes about it: Lautner

used preferably unmounted photographs, and held them during his observations against the light—a window or a lamp with a white globe—thus the photographs became more transparent and the tone-differences, particularly in the shaded part of the picture, appear more distinctly than can be observed on a mounted photograph.

To examine the several parts of the photograph in this manner as distinctly as possible, he laid a piece of paper over it from which he had cut out a square about 3 x 4 cm. Thus he observed the space which had become visible by the opening.

On mounted photographs he threw concentrated light upon the several parts, and particularly the dark ones of the photographs, by means of a large magnifying glass. These he submitted to observation; and to do this exactly and to simultaneously enlarge several parts of the photograph, he applied eventually a second magnifying glass.

Lautner used then a photographic intensifying method invented by himself and which is based upon the exposure of a chloride of silver gelatine film, or paper, under the same or identical negatives. By this intensifying method, he says it is possible, to intensify the contrasts of each photographic picture in the reproduction, to the extreme.

The process in its details is described by Lautner before the "Schlesische Gesellschaft" demonstrating the same on a picture (Joseph and Potiphar in the Berlin picture gallery) as follows:

Of the parts in question pictures have been made in the ordinary way in approximately the original size, first upon bromide of silver gelatine plates, afterwards upon films. From the glass plates two negatives (1*a* and *b*) were produced; 1*a* in the ordinary way by placing the plate in the holder film side up; the other 1*b* with the film side down and changing the ground glass to correspond in focus.

By application of films, which can be worked from both sides, the second negative was not necessary. Of these negatives a positive is made on chloride of silver gelatine paper (print No. 1), by making first of negative 1*a* an ordinary print, and then exposing this unfixed point for the purpose of intensification from the paper side under the second glass negative (1*b*) that is the reversed film negative. To obtain thereby a complete fitting of the print (copy 1*a*), obtained by exposure of the film side and the negative (1*b*), laid upon the paper side, and to obtain simultaneously more favorable conditions for the action of light upon the chloride of silver gelatine film, the light sensitive paper was soaked with petroleum or benzine on the reversed side.

To avoid a too rapid evaporation of the transparency medium, the paper side was covered with a gelatine skin, such as is used for tracing, and then with a few layers of ordinary paper. The further copying arrangement consisted of two glass plates, of which one was laid upon the printing side, and the other, cut in the middle, upon the reversed side; the whole was held fast by two clips. Recently the light sensitive paper was first printed from the reversed side, and then from the face. The so obtained first and in its contrasts intensified positive (copy 1*a* and *b*) is fixed as ordinarily, the petroleum or benzine causing no disturbance. Of this positive intensified in the contrasts a new film negative (negative II) was made, of almost equal size in which the contrasts appeared stronger than upon the negatives 1*a* and 1*b*, corresponding with the now more powerful contrasts of the first copy (copy I). After the same process a second

positive (copy II) was produced; of this, again, a negative (negative III); then, again, a positive (copy III), etc., according to requirement.

In the foregoing case the "designation" in question is upon a surface not evenly bright, the part to the right from the observer being brighter than the one to the left. If the negative made in the ordinary way herefrom was repeatedly intensified, the left and dark part of the original place in the negative would brighten up gradually and the right and light part of the original place in the negative would become very dense, whereby the details in both parts are lost. The simultaneous and even printing of both parts proved therefore to be useless. To avoid this defect it was managed in two ways, as follows:

a. The bright part of the negative was covered in the usual manner upon the glass side with carmine, or after oiling and coating with mattolein, with lead pencil (but not upon the film side of the negative), which therefore cannot be considered as retouching in the usual sense.

b. The first negative (negative I) is cut correspondingly in its bright and dark parts and intensified in the above described manner in its separate pieces to a degree, that the details appeared distinctly upon the several pieces of the negative and also the positive. In consequence of this separate intensification of the several parts the details appear in approximately equal intensity upon the picture No. II, composed of two pieces, upon the dark side as well as upon the bright side of the original.

Even in the photographic reproduction of the picture in question the letters B O L can still be recognized. One is on the right side of the left foot of Potiphar's wife, immediately under the deepest part of the seam of the dress, the other at a distance of 24.2 cm. in vertical distance from the lower edge of the chin of Joseph. I must acknowledge that these places look rather peculiar to me, the letters being curiously distorted.

Sometimes in Roman, sometimes in Gothic characters, sometimes there is an inscription (B O L) in the middle of the capital B and sometimes it looks if one was to play hide and seek. The letters have not been written honestly, but have been scratched in the painted ground with the reversed part of the brush handle. Over this has been painted again. In short, in spite of photography I am not quite convinced yet about the matter, although I believe that Lautner's process may be very useful to decipher old defective hieroglyphics and concealed letters.

The paramidophenol which you have already mentioned in the BULLETIN as a new developer, was not recognized first by Lumière but by Andresen. The latter has made an interesting scientific investigation about that body disclosing some entirely new features about the developing power of several compounds.

It is, as known, a peculiar property of many organic compounds, to reduce the salts of silver; but the number of the organic compounds which reduce only exposed silver salts, leaving unexposed silver salt intact, is a proportionally limited one. To obtain experimentally certain rules, substitution products of benzole and naphthalin, known with regard to their constitution, were examined. Regarding these substitutes aim was to be directed in the first line to the amido group (NH_2), and the hydroxyl group (OH) as well as to the aldehyd group (COH). By the experiment it was first determined that mono substitution products exercise no reducing action upon the latent photographic picture. Towards aniline, phenol, naphthylamin, naphthol, benzaldehyd, etc., exposed

bromide of silver film remained completely intact, even in presence of caustic alkalies. Benzidin (diamido diphenyl) behaved in this respect also exactly like a mono derivative.

The capacity to develop the latent photographic picture upon bromide of silver films commences, however, with the disubstitution products.

By experiment it was further determined with certainty that of the many substitutions the amido group and the hydroxyl group are to be taken in particular consideration, while the aldehyd group, even in presence of an amido or hydroxyl-group (for instance, in para-oxy-benzaldehyd), did not show the least action.

Of the substitution products we know now three isomers of diamido benzol (phenyldiamin), namely, para, meta and ortho-phenyldiamin.

The first developes excellently, the third (Brenz catechin) likewise; but the meta body does not. Of the body, which we call now phenyldiamin, there exists also three isomers: Para, ortho and metaphenyldiamin. The former two develop, but the latter does not. The former is, according to Andresen, the most powerful developer.

Thus a new principle has been discovered, which will lead us pretty soon to a new developer. Andresen mentions many new things about the properties of the para-mido phenol, and gives a good and useful formula. He says:

Considering in particular the para-amido phenol,

$$C_6H_4 \left\{ \begin{matrix} NH_2 \\ OH \end{matrix} \right\},$$

it may be mentioned that it can be dissolved easily in hot water, but in cold water it is proportionally difficult to dissolve.

The para-amido phenol forms two classes of salts. With acids salts which are quite easily soluble in water and excel as, for instance, the hydrochloride of para-amido phenol,

$$C_6H_4 \left\{ \begin{matrix} NH_2HCl \\ OH \end{matrix} \right\},$$

by great crystallizing capacity. From concentrated solutions of these salts carbonated alkalies will precipitate the free para-amido phenol. In great dilution (1:200) it remains in solution even at ordinary temperatures.

With caustic alkalies salts are formed in which the hydrogen of the hydroxyl group is replaced by alkali metal, for instance: para-amido phenol sodium,

$$C_6H_4 \left\{ \begin{matrix} NH_2 \\ ONa \end{matrix} \right\},$$

these are easily soluble even in cold water.

This shows that two lines of developers can be produced with the para-amido phenol, namely, those with carbonated alkalies, which contain the para-amido phenol as such dissolved, and those with caustic alkalies in which an alkali salt of the para-amido phenol comes into action. Both kinds have to be designated, therefore, as very useful.

The para-amido phenol sodium develops extremely quick and powerful. The better kinds of dry plates found in the market give without addition of bromide of potassium completely clear negatives, which show a blue-black coloration so favorable for printing, and which can be obtained also with hydroquinone.

The following formula was used: In 100 c.c. boiling water, 30 grm. potassium meta bisulphite, and then 1.0 grm. hydrochloride of para-amido phenol are dissolved. To the (double) solution so obtained concentrated soda lye is added, under slow stirring, until the precipitated para-amido phenol dissolves again.

For use, the solution of the para-amido phenol sodium thus formed, is diluted with 5.50 parts of water, according to what strength of developer is desired.

As will be seen, the formula demands only so much soda lye as is required for the formation of the soda salt, which, in consideration that certain kinds of plates cannot stand superfluous soda lye, deserves to be mentioned particularly.

With carbonated alkalies, the developer must be diluted considerably on account of the difficulty with which the free para-amido phenol desolves.

The formula recommended by A. & L. Lumière is too concentrated. I work ordinarily with a solution made after the following formula:

Hydrochloride of para-amido phenol	5 grm.
Sulphite soda cryst.	50 "
Potassium hydrate	25 "
Water	1000 c.c.

This developer works slower than the one with soda-lye, but is particularly good for time views.

The para-amido phenol is, therefore, a substance equal to any of the proposed developers; but I believe that, for practical use, eikonogen, which, in composition, is nearest to para-amido phenol, might be given the preference.

THE EXHIBIT OF PHOTOGRAPHS AT THE BUFFALO CONVENTION.

Second Notice.

A large collection of bromide work attracted much notice, the Eastman Co. showing some good specimens in several tones of black, and were awarded second prize, and Inglis & Co. several similar ones, together with a beautiful assortment of enlargements in that rich, warm brown tone, so satisfying to the photographic eye. The selection of subjects and execution of their work throughout was most happy, and the results obtained were in the nature of a surprise, even to those who had become familiar with the possibilities of bromide printing in the past. One subject, a lady standing, was a notably strong exemplification of the strength and richness of their capabilities. They obtained first prize.

C. C. Langill, of New York, was represented by a miscellaneous collection of exteriors and interiors, which were particularly striking from their beauty and finish in every detail. The prints were remarkable for the masterly manner in which strength of lighting and composition was combined with a fulness of detail that showed the texture of stone, wood and decoration with the utmost truth. Many encomiums were lavished on this display, which was awarded a first prize.

C. Heimburger & Son showed a collection of 8 x 10 and 11 x 14 landscapes, which were more excellent in tone and finish than in composition, the artist not making good use of straight lines, such as roads, lanes, fences, &c., but allowing

them to lead too much into and through the picture, often breaking it into two or three distinct compositions. Obtained second prize.

J. M. Brainerd, a fine frame of architectural subjects, which won him a first prize and which were capital both in composition and finish—and in the portrait class several very strong examples of lighting and posing—gold medal.

A most interesting display of orthochromatic work was shown by Chas. Truscott in which comparative results from ordinary and orthochromatic plates, exposed on the same subjects were arranged side by side. Many of the originals were oil paintings or colored drawings, and the value of the comparison would have been materially enhanced if they could have been seen with the two reproductions. The difference to be noted between the results made with and without screens was, however, very marked.

N. McMichael, of Buffalo, was seen in a large frame of landscapes studies with figures, which were creditable in the extreme, but many of which seemed to lack that element of oneness between the action of the poser and the sentiment instilled into the mind of the observer by the natural scenery making up the background and accessories.

Poulton & Son, of Richmond, Surrey, England, were represented by an exquisite set of views, mostly landscapes, and many of them made in the mountains and on the shores of foreign countries, where if the atmospheric conditions were not exceptionally favorable the artist must have been unusually gifted; a group of fishing boats on the shore of a bay, with distant mountains in the background, being a gem.

In the large portrait class three heads, by W. J. Byrne, were much admired, one of a child with drapery and another of a Turk, being admirable for softness and dainty treatment, and breadth and strong handling respectively. Obtained first prize.

Mueller, of Munich, Germany, showed six cabinet portraits in platinum, beautiful in everything that goes toward making a perfect picture, the soft, round modeling, brilliant high lights and dainty detail in shadows being rendered in the platinum with a fidelity seldom met in any other agent. Obtained second prize.

Valentine & Sons, of Dundee, Scotland, exhibited several views of life on the plantations of India and some rugged mountain passes, which were much admired, not only for the strength of composition and artistic merit in grouping of subjects, but for finish and technical qualities as well. Their display suffered nothing by being in juxtaposition to that of H. P. Robinson, of England, good as his always are, one in particular, of a female figure on the edge of the marsh (in platinum) was especially striking, and another of a flock of sheep feeding in the heather, with one of the peculiar sky effects which this artist is so happy in securing, will long be remembered by those who saw them. If any criticism were to be made on this collection, it would be that the printing was not on an equality with the negatives. In several instances it seemed to us that the prints might have been better than they were.

We had almost forgotten another delightful bit of rural life from the studio of Clara E. Sears, of Boston, whose ideas of composition seem to harmonize perfectly with the sentiment of the subject before her—a dusty road and bridge over a slow-running country brook and two horses grazing in the grass and rushes in the foreground was a gem, and the corn field, with the shooks of ripe corn bathed in sunlight, was a study of nature which only needed the faint rustling of

the breeze to make one imagine himself back on the farm as it was in the olden time. This was awarded first prize.

Bell & Overton, large and small portrait work, of which the latter was the better; the posing was effective and lighting good.

C. O. Smith, a number of large portraits which were better in posing than in execution in many cases, the half tones were lacking, which, while it gave an effect of strength to the work, was not pleasing from a photographic standpoint.

H. S. Bellsmith, seven large bust pictures, which were strong and effective.

J. B. Schreiver, a good collection of large and imperial sizes.

A. L. Bowersox, a large assortment of cabinet-work, showing wide range in selection and treatment of subjects.

Ranger & Cornell, good exhibit of various sizes. Treatment generally strong and effective.

H. G. Peabody, of Boston, was noticeable in an exquisite display of marine work, prominent in which were a number of views of the White Squadron that were artistically and technically excellent. Awarded prize.

J. K. Lane, six large portraits. Three full-lengths were eminently strong in treatment, one of which also stood out in bold relief as an extremely strong and pleasing study of posing. Silver medal.

E. P. King, three large portraits, exquisite in modeling and detail and strong in lighting and posing. The work of an artist. Gold medal.

Frank S. Clark, large work, of which "In the Harem" was an example of ambitious effort in posing which was much commended.

J. L. Ross, compositions representing the ideal after the Greek style, Poetry and Music being the most pleasing subjects.

H. McMichael, in study of "King Lear," showed a strong, effective and artistic conception well carried into execution.

Stuber Bros., an exhibit of large work in platinum, which was not in competition, but which from our individual standpoint was one of the finest in the gallery. The exquisite tones obtainable in this beautiful medium were all there and admired by all who saw them.

Geo. C. Thomas, in two of his conceptions, "Innocence" and "The First Toilet," was particularly happy in choice of material, and his work full of good points.

The same may be said of M. T. Hatton regarding his picture, "Her Début," where the fresh child-life was depicted with an abundance of nature and an utter absence of affectation refreshing to see.

Cook Ely was represented by six 16 x 20 prints, of which "The Same Old Story" and "Watching the Circus Pass" were full of life and feeling.

Bill & Overton, large portraits, one of a boy being fine in strength of treatment and pose.

Geo. Van Norman, frame of large work of good quality, prominent in which was a portrait of a man seated, showing unusual ease and grace in pose.

L. C. Overpeck, collection of miscellaneous work, including some fine specimens of machinery.

G. Weinig, an excellent collection of work from retouched and untouched negatives. Was awarded first prize for retouching.

W. H. Jackson (not in competition), a series of about thirty views of heroic

size, some being as large as 6 feet by 3, remarkable for the richness and depth of focus and the technical quality of the work throughout. Awarded a special diploma.

ORTHOCHROMATIC PHOTOGRAPHY.

BY G. CRAMER.

[Read at Buffalo Convention.]

In my lecture delivered at the late Washington Convention, I have given the outlines of the history and description of ortho or isochromatic photography (both terms meaning the same), viz.:

The art of correctly or equally rendering in monochrome the various colors which in the ordinary process have such a different effect on the sensitive plate; that blue and violet are reproduced much lighter, yellow and orange much darker than they appear to the eye. The orthochromatic process is receiving the highest attention abroad, while on this side of the Atlantic we have been considerably behind the times so far, but with the well known determination of our people to march in the front ranks of progress, we shall soon make up for lost time, fully acknowledging the importance of orthochromatic photography. Inasmuch as the great problem to make photographs in natural colors is being far from solved, we must aim to accomplish the next possible, to reproduce the colors in monochrome in the true gradations as they appear to the eye.

American manufacturers have commenced to give orthochromatic plates their attention, and I, for one, have spared neither trouble nor expense to produce colored sensitive plates that meet the requirements of photography in its present advanced state. In the commencement I was assisted by the talented Boisonnas, of Geneva, Switzerland, known in Europe for his success in this direction; but whose experiments were unhappily cut short by his untimely death.

Later on, I availed myself of the offers made by the well known B. J. Edwards, of London, and Attout Tailfer, of Paris, whose isochromatic plates have a great reputation in Europe, and I have followed their example in adopting the name "isochromatic." I am now in the position to furnish plates that combine great speed and fine quality with good orthochromatic effect without the use of a yellow screen. The yellow screen, which serves to filter the light, and is either a yellow glass placed behind the lens or a yellow pellicle inserted with the diaphragm, necessarily slows the action of the light, and demands a much longer exposure in direct proportion to the depth of color of the yellow glass or pellicle employed. It also causes trouble and annoyance in focusing.

It has been my aim to dispense with it, and I have succeeded in preparing rapid plates which are sufficiently orthochromatic for landscape and portrait photography without the use of a yellow screen.

For copying oil paintings, where long exposures are not objectionable and where it is imperative to secure the fullest orthochromatic effects, I prepare a slow plate especially for this purpose.

It has been stated that the orthochromatic effect can be obtained with ordinary plates simply by the use of a yellow screen, but this idea is erroneous. The plate must have the elements of color sensitiveness in itself; and in comparing orthochromatic plates, they should be tried without a yellow screen to determine their merits.

Now, let us see what are the advantages of an orthochromatic plate over an ordinary plate, for instance in landscape photography.

Let us imagine a landscape before us, above the blue sky with white clouds, in the horizon the distant hills, in the foreground foliage in the beautiful shades of autumn. The ordinary plate would take the sky white, being just as sensitive to the light blue as to white rays; and therefore will show no clouds unless they are of a darker shade. The distant hills would only be faintly visible and the foliage be lacking in detail. The orthochromatic plates would give us a soft gray sky, not white but with beautiful white clouds; the distant hills just as distinct as you see them in reality, and the foliage with all the various gradations, from the finest high light to the deepest shadow, every leaf being clearly detailed, and every blade of grass standing out from the rest. In all it gives us just what we see with our own eyes, except the colors. For portraits, we will consider to photograph a pretty rosy-cheeked girl from the country, rosy cheeked, but a little freckled, with a blue dress and yellow trimmings, and with auburn hair. The ordinary plate will give her a fair face, but what a job to retouch all the freckles. The blue dress will appear like a white one, the yellow trimmings will be too dark. Her hair will show a great lack of detail, and appear the same as black hair. While the other plate will give, if anything, a bolder, rounder image, freckles will not be visible to a greater extent than you see them with your eyes, and in the portrait are generally smaller than the original as they are almost entirely invisible. The hair will be of a medium shade, and as full of detail as that of a brunette. The dress will be of a proper tone, the yellow trimmings in harmony with the rest.

Now, for another portrait. A gentleman from the country with blue eyes and straw colored hair, fairly sunburnt, and with a clear white forehead. You know these kind of subjects (I believe there is no photographer who does not get some of them). In his photograph, the eyes are a colorless spot, the hair too dark, face without the roundness and life it should have, with a solid white forehead. The isochromatic plate, on the other hand, does justice to the eyes and hair, and gives tone to the forehead and roundness and gradations to the face. For copying paintings or colored drawings they are the only plates that can be used with success, the reason for which I do not believe it necessary to further illustrate, as you will observe by looking over the various pictures on exhibition at this meeting. I wish further to state that in developing the isochromatic plates, you must bear in mind that they are very sensitive to the yellow and orange light, and nothing but a dull ruby light can be used with safety, with the precaution to keep the plate away from any light as much as possible.

DEVELOPING.

BY E. DECKER.

[Read at Buffalo Convention.]

"There is a great deal of difference between seeing and observing." There is a mountain of truth in a mole hill of words in that quotation, which will apply to developing as well as many other things.

It is merely putting in "brains Q. S." with the other constituents of the developer, but that makes all the difference (except through pure luck) between a

negative that will make a photograph that is a joy to look at, and a piece of paper with a blotch of silver over it. New developers and new developing agents can be obtained from nearly every one of our photographic journals. They are probably all good, only some may be better than others. It is not so much the formula, but the way it is used, that gives the result. There are probably no two persons using the same plates and developer that will procure the same quality of negative. One will only see that the image makes its appearance in due course of time, will see that it continues to develop, and when he sees that it is sufficiently dense will remove it from the developer. Another will not only see when the image appears, but will observe whether it is too slow or too quick and will add a little force or apply the brakes, as it may need. He will observe the exact time when it should be removed from the developer and whether it should be washed very quickly before applying the fixing or whether a longer washing would be better.

Whether pyrogallic acid, eikonogen, hydrokinon, iron or any of the very latest developers should be used, should depend upon the observation of each one using them. Each one may be better for some special purposes than any or all the others. For general use, however, each person should adopt some special developing agent, learn to use it and stick to it. Have also a standard developer, but as there are many exceptions to most rules, so remember that you must look out for these exceptions in the way of different plates, different exposures and different subjects, and strengthen or weaken your developing agent or your alkali or add a retarder.

Among all the old or new developing agents "pyro" still holds the lead and from all appearances will continue to do so. So far as my own observation goes it gives better strength, better detail, better printing qualities and, for an over-timed or undertimed plate, a better negative than any of the others. It may not make so handsome a negative as some of the others, but it is not the beauty of the negative itself that is wanted, but the beauty of the print to be made from the negative. It is true it may stain the hands, but that can be remedied by using a pair of rubber gloves. The staining of the negative itself, where it goes so far as to be a detriment to its printing qualities can be easily remedied, but in most cases, particularly where it only leaves a slight olive color, it is much preferable to what is called "a wet plate effect."

You can make with "pyro" a negative as "thick as a board," or one as delicate as the bloom on a young lady's cheek with the same kind of plate and the same exposure.

With the quickest plate a line drawing can be copied that will leave the lines pure black and the whites white paper, or all the detail in lights and deepest shadows in the portrait of the fairest blonde dressed in her bridal robes. To develop a first-class negative presupposes a correct or nearly correct exposure of the plate.

Perfectly correct exposures are and must be extremely rare. It would take a long mathematical calculation and very sensitive instruments to give the exact strength of light, with its shade of color, and more exact shutters to our lens than we now have, with an operator at the shutter, capable of taking advantage of all the mathematical and scientific points, to "touch the button" at the exact instant of time to get that exact exposure.

Such being the case, a "standard developer," while being "handy to have in

the house," can be very seldom used without some change, if the very best effects are truly sought for.

Have your sulphite of soda and your alkali of a standard strength, add the pyro only when you are about to use the developer; make a little stronger solution of pyro for emergencies and have your bromide ready for use. Then use all with discretion, not only seeing, but observing.

Have you ever thought how much developing a plate is like creation? Do you ever think that you are creating a little world every plate you develop? The developer is poured over the plate and soon the tops of the highest mountains appear in the shape of the highest lights, then the lower hills as the lighter shadows, then the rolling and flat earth as it graduates into the deep shadows represented by the sea. Usually we develop our plates that we can say when finished, "behold, it is good."

JULY 16, 1891.

REPORT ON THE PROGRESS OF PHOTOGRAPHY.

BY ARTHUR H. ELLIOTT, PH.D.,

Editor of Anthony's Photographic Bulletin.

[Read at Buffalo Convention.]

MR. PRESIDENT—The task of making a report on the progress of photography has hitherto been one not fraught with unalloyed happiness for the individual who has undertaken it before this Association. It is also a curious fact that the editors of photographic journals have always been selected to make this report. There is possibly a method in this selection, the officers of the Association evidently believing that editors of journals are the only members of the fraternity having skins of sufficient thickness to stand the arrows of the critics of their work. I have on a previous occasion had to withstand these shafts. I know how much they hurt, and am here again ready to submit my effort to the same chances. But of one thing I am fully conscious, and that is, that those who know the task will appreciate the difficulties and have a fair charity for my effort.

Beginning with the apparatus of the professional photographer, we do not find any important advances. The cameras that were used a year ago hold their places in the estimation of the practical man. In the matter of hand cameras we note some quite unique improvements. In this respect the new film camera called the Kamaret is undoubtedly a marked advance in the utilization of the space within the box to secure the most compact disposition of the parts. The roll is so arranged that it occupies the space between the cone of rays from the lens and the side of the box. By this method of disposition, space hitherto not used has been made available, and the most compact hand camera now in the market is the result. Coming to the use of plates in hand cameras, we must give the palm to the new magazine camera of Anthony. This embodies several new devices that are quite ingenious. First, the plates are made to come into focus automatically by means of a spring, and after exposure a single push on a button takes the exposed plate out of the way into a well, leaving another plate in place for further use. Second, after all the plates in the magazine of the camera have been exposed, the camera may be loaded up again by attaching a reservoir box to it containing a new lot of plates, which are

readily transferred to the body of the camera by the use of a couple of slides. The empty box can now be used to hold the exposed plates in the camera, and these are removed by attaching it to the bottom of the camera, and with the movement of two slides the plates fall out to give place to those that are to be exposed afterwards.

When we remember that all these transfers are accomplished in open daylight, we must confess that this is a decided advance in the construction of hand cameras. Yet another hand camera must take a little of our attention for a moment. This is the Hetherington. Here we have a camera using plates that are arranged pretty much as the leaves of a book. As each plate is exposed it is turned down out of the range of the lens, just as you would turn down the leaf of a book if it was stood up on its back closed. Each plate is turned down; a spring brings a new one into place. This is a most ingenious piece of apparatus; but as soon as the plates are all exposed you have to resort to a dark room to refill the plate-holders.

In the matter of lenses, by far the most important step has been taken by Carl Zeiss in the adaptation of the Jena glass to photographic lenses, and the construction of a lens in which the chemical and visual rays come to one and the same focus. Yet another improvement is the use of lenses so corrected that they may be used at very short focus and wide angle without the distortion hitherto encountered in lenses of this character. There is no doubt that this Jena glass, which has done such wonders in the field of miscroscopy, is destined to teach us some new things in the world of photography.

While on the subject of lenses we must not forget to speak of the efforts of the English lens makers to come to some understanding in the matter of threads and flanges of the lens mounts. Although nothing definite has yet been accomplished, a report on the subject has been approved by the principal English lens makers, and with a little further modification there is no doubt that an uniform screw thread for the lenses of the same size, also an uniform thread for tripod screws, and an uniform system of marking the diaphragms of lenses will be adopted by all the English makers, and probably by those of America, France and Germany. If this can be accomplished the photographer will be in the same position as the microscopist, in having all his lenses of the same size fit into the flanges on his cameras or into adaptors that also are uniform for all makes of lenses.

While we are noting the novelties in photographic apparatus, a word about the new rival of the photographic operator is worth our attention. We mean the automatic photographing machines, where you put a nickel in the slot and get your picture taken, framed and all. But they are at present not worth more than a word, for all we have seen are easily distanced by the poorest tintype artist that visits the smallest country town. Nevertheless, these machines are the beginning of a series of inventions that will make a likeness of the sitter in front of them, and purely by mechanical motions as certain in their action as those of a clock. At present they are more of a curiosity than an innovation in photographic work.

Since we last met quite a furore has been seen in the matter of color photography. Professor Lippmann, of France, startled the world with the announcement that he had discovered the secret of taking photographs in their natural colors. After developments proved that he had repeated the experiments of Ed-

mond Becquerel, made twenty-five years before, except that he had used glass plates with greater success. Practically his work is of little value, but it is interesting as a development of the theory of interference in light. The pictures he obtained are of the same character as the colors of the soap bubble in the sunbeam or the film of oil on water.

Working in the same field of research, but with much better experience to guide him, our own Carey Lea has shown us some new wonders in the properties of silver chloride. Indeed, he has discovered that the basis of modern photography, the metal silver, is capable of existing in several distinct colored modifications. I cannot now take time to go into details upon this most interesting scientific development, and must content myself with referring my hearers to the photographic journals and the *American Journal of Science* for the past year.

The Austrian photographer, Verecsz, who also experimented in the field of color by photography, did work that is but a modification of the work of Carey Lea.

Some means of determining the actinic value of light in its relation to photography has long been a desideratum, and the English experimenters, Messrs. Hurter and Driffield, together with Capt. Abney, have arrived at some interesting results, showing that the exposure determines the gradation of lights and shades in the negative. Incorrect exposure will not give an harmoniously graded negative, and, furthermore, this incorrect exposure cannot be improved by a change of development. They have devised a method of determining the proper time of exposure, but at present the apparatus is more scientific than practical.

A much more convenient apparatus for the purpose of determining the time of exposure is the neat little actinometer of Ballard, which depends upon the measurement of the actinic power of the light on a subject by finding out how long the photographic, that is the blue and violet rays, take to fade from a phosphorescent tablet that has been exposed to their influence. Its mode of operation is very simple. A small tube, blackened inside, has at one end a tablet of luminous paint, so arranged that it hangs by a hinge which allows it to be exposed on the subject for half a minute. The tablet is then closed over the tube, and by looking into the latter the time of fading to a standard tint, also in the tube, gives a figure that is a measure of the photographic power of the light reflected by the subject. It is practical, and its indications are just as good as the sensitometer with which we determine the rapidity of our dry-plates.

This same actinic power is modified by our use of the diaphragms in the lens. But here also some experiments of the past year have given us some new light. Dr. Michelke, of Germany, has shown that if we reduce the size of the opening in the lens to one-fourth we shall have to increase the time of exposure, not four times, as would be expected, but twenty per cent. more, or nearly five times. By using yet smaller openings we must add still more to the time, and with one-thirty-sixth of the opening the time will have to be forty-eight times as long, or an increase of one-third the calculated time for correct exposures with a corresponding larger stop. In a word, if the time of the exposure is correct with a stop of one inch, and it is desired to use a stop of one-quarter of an inch, we must increase the time of exposure, not four times, but nearly five times.

In the field of orthochromatic photography, as it is called, there is not much

new to report, but we are very glad to note that our American manufacturers are making some of the best dry-plates of this kind to be found anywhere.

We are surprised that American photographers have not been more active in the adoption of these plates in their portrait work, for there is no doubt that they save an immense amount of retouching, not to speak of the better gradation of light and shade in the costumes of the sitters.

We hear rumors of the advent of collodion plates that are as rapid as the gelatine dry-plate, but we have not heard of any practical use of these plates. It is stated that at the present time they are twice as costly as the gelatine plates, but it is only a question of time when we shall have them in competition; and for many purposes they may be found of advantage even at double the present prices of dry-plates, notably in photo-mechanical work.

Flash-light photography has many workers and it is constantly being put to good use and its manner of application being improved. Various devices have been employed to overcome the hard shadows that were to be found in the first pictures made by its use. The methods of doing this are in the division of the magnesium powder into a number of small charges rather than using it in one large flash. These charges are fired simultaneously by the use of a number of gas jets that are made to impinge on pieces of gun-cotton on which is placed the magnesium, the projection of the many flames, at the same instant being controlled by some device that regulates the pressure of the gas and increases it at the same moment at every jet. Pictures made by these methods are very hard to distinguish from those made by daylight.

The color of the magnesium light is capable of much modification. And in this respect may be a most useful adjunct to the orthochromatic plates. Two German experimenters have applied this in photo-micrography using a mixture of perchlorate of potash with magnesium, chloride of sodium and tartrate of barium, with some excellent results.

The development of the photographic plate has received a good deal of attention during the past year. In the matter of developers there is not very much to report, but quite recently paramidophenol a substance related somewhat to eikonogen has been proposed as a new agent. Like eikonogen it is very soluble and it is also rather expensive; but if it is found to have any decided advantage the chemist will soon find a way to make it cheaply. At the present time it is said to possess good developing powers, and its use gives no stains on the films. Compared with eikonogen and hydroquinone, it oxidizes more rapidly than either. It is consequently more active than these developing agents. But its most important advantage is the fact that it will not color the film and can be used for a large number of plates in succession. It is said that as many as twenty plates may be developed in the same bath without causing the least stain on the negative. From these indications it would appear to be as rapid as pyro without its staining defects.

In connection with the subject of developers, the interesting experiments of Colonel Waterhouse deserve a moment's attention. He has found that by the addition of a very small quantity of thiocarbamide to the developer of eikonogen it is possible to produce a positive image instead of a negative one. This is a matter of small importance to the ordinary photographer, but to those who have to work the photo-mechanical processes it is a saving in the steps to be taken for the production of the final printing plate, for it saves the production of a positive from the usual negative.

Coming now to the printing processes, we must record the revival of the use of gelatine as a substitute for albumen, with more improvements than it has seen in many years. Aristotype paper has made some very important advances during the past year, and if the march of progress is continued it may supplant albumen paper entirely as a basis for the photographic print.

Platinum printing still holds its own with amateurs, and it would be a source of profit to the professional photographer, in the better class of work, if he would but take time to overcome some of the earlier difficulties. In Europe they are far ahead of us in this matter.

A new printing process was presented to the photographer by two English chemists some months ago, which depended for its action upon the change made by light in the chemical structure of a dye-stuff made from the coloring matter known as Primuline. This substance has the curious property of uniting with different organic matter and producing with each one a colored print. If therefore we print in diazo primuline from a star-shaped negative, we can make each of the star rays of a different color, by the use of different organic matters put on as developers in the form of paste. The great drawback to the success of the process is the color of the ground, which is of a bright yellow tint. Up to the present time the inventors have not been able to change this color, but if it is ever accomplished, we shall be in possession of a printing process of great beauty and capable of many variations, this, too, without the use of silver or any other metallic salts, as the substances used are entirely of organic origin.

The application of photography to astronomy continues to give the most wonderful results. Stars unseen by the human eye are detected by the photographic dry-plate. And some recent photographs made in Sydney, Australia, show that the stars of the milky way are really larger than they appear to the eye through the telescope. This is due to the fact that they emit many blue rays which are invisible to our sight, but whose light affects the photographic plate.

Photo-mechanical printing processes have made important advances in color printing in which they are now producing some of the most beautiful work ever attempted by the aid of light and the printing press, and without the aid of the human hand. In this respect the work of Bierstadt, of New York, surpasses anything of the kind ever attempted before. By the use of colored screens, he takes several negatives of the different colors that make up the painting he wishes to produce by photography, and by means of these he prepares corresponding gelatine surfaces that serve as the basis for the printing of the colors by superposition, as in the lithographic methods. The results obtained are very beautiful and are almost a perfect facsimile of the original picture. It will be by some such process as this that we shall be able to make, not take, photographs in their natural colors.

Such is a very rapid survey of the advances of our art since we last met. In the brief space that could be given in such a report as this, many really important steps of progress have received but a word of mention. This is not because of the lack of appreciation by the reporter, but from a fear that during these warm days a long disquisition would weary you.

If I have failed to do all that you have expected of me, please remember that I am only an editor, and while I fully appreciate the honor you have conferred upon me, I hope I may not be forgotten in your charity.

DEVELOPMENT.

By Prof. R. Hitchcock *of the Smithsonian Institute, Washington, D. C.**

At a meeting of the members of the China Camera Club, held at their rooms in Saunder's Compound, on Wednesday evening, June 10th, a most interesting discourse was delivered by Professor R. Hitchcock, of the Smithsonian Institute, Washington, D. C., on "Development," which was illustrated by the practical manipulation of several plates exposed by himself and members. About twenty members were present. It was decided to have an exhibition under the auspices of the club in October next, after which the lecture was proceeded with. Professor Hitchcock in the course of his remarks, said :

It is with some diffidence that I venture to address you upon such a time-worn subject as developing, particularly since I have no new and complex mixture to recommend to you as the Hitchcock developer. The subject was first suggested by Mr. Emens, and since it is one to which I have given some particular attention, I have thought a few words concerning the specific action of the developer constituents might interest those of you who are not chemists.

I shall speak only of alkaline developers for gelatino-bromide plates, and while I shall strictly refrain from making comparisons between the various developers in use, it is well to explain how such comparisons can be made in practice. For this purpose I prefer to expose a plate in the camera upon any subject having a considerable gradation in light vertically, but of one general character horizontally—one in which there is shadow, foliage and sky is good. The plate is then cut vertically into two or more strips and these are developed in the solutions to be compared. We thus have a practically uniform exposure over the plate, and the results are due to the development alone.

It was in this way that I found, in the early days of eikonogen, that this developing agent would give all the delicate gradations of pyrogallol with a smaller proportion of alkali; and more extended and varied experience has fully confirmed that conclusion. The fact is of importance here in Shanghai where in warm weather the gelatine is prone to soften even when the solution is weak in alkali.

The alkaline developer consists essentially of three active agents :

First.—The reducer—pyrogallol, eikonogen, hydroquinone, etc.

Second.—The alkali—sodium carbonate, ammonia, etc.

Third.—The preserver—sodium sulphite.

The function of the first is to reduce or decompose the silver compound in the gelatine film producing metallic silver, which then appears under the microscope in the form of minute-opaque particles. But this decomposition only takes place when the alkali is present ; and so nicely balanced are the chemical forces here involved, that the reduction only takes place when the proportion of alkali exceeds a certain limit. A gelatine plate, which has not been exposed to actinic light, placed in a solution of alkali and pyrogallol remains white until the proportion of the former is sufficient to affect decomposition of the silver compound, when the plate blackens all over. This is "chemical fog." When a plate is exposed to light and placed in a weaker developer it also turns black all over. Such a plate is said to be "light struck." The light has therefore produced a change in the silver compound of the film, which renders it more easily

* From authors' corrected report.

reduced by the developer. It is obvious, therefore, that by exposing a plate in the camera we can develop a picture in which the lighted parts become black, the deepest shadows remain white, and intermediate gradations of light are more or less correctly reproduced. This is "negative." With this knowledge we are in a position to establish, experimentally, the proper proportions of the ingredients of a developer.

But first we have to consider the exposure of the plate in the camera, for the composition of the developer must be changed to correspond with the lighting of the plate. This being true, the expression we so often hear "a properly exposed plate" is only correct as regards a developer of a particular composition. For it is an unquestionable fact that the duration of the exposure can be varied within very wide limits—say from one or two seconds to ten or twelve, and equally good negatives produced with different developers.

But this result can only be obtained with great care and skill, and it remains for us to so adjust the time of exposure and the composition of the developer that good pictures are obtained without changes in either, whatever the character of the subjects may be. In other words, what shall be the properties and composition of what we may designate the normal developer?

This question brings us to a more careful consideration of the functions of each of the constituents of the developer. The nature of the change brought about by light has long been a subject of discussion among chemists. My own experiments, published in two articles in the *American Chemical Journal*, have demonstrated the fact, which has been disputed for a century, that light reduces silver chloride, producing free chlorine and metallic silver. This fact has no doubt an important bearing upon the subject before us, but much delicate work requires yet to be done before a satisfactory explanation of photographic operations can be given. Taking these up in the same order as before, we may, for convenience, take pyrogallol as the type of all the reducing agents used in alkaline developers. This substance reduces the silver compound in the film wherever the latter has been exposed to light as already described. But the extent of this reduction, in other words, the density or color of the film where the reduction takes place, depends upon the intensity of the light's action and upon the proportion of pyrogallol in the developer. Now, a solution strong in pyrogallol gives a strong and dense reduction. A weak solution gives a feeble and thin film. Consequently, if we have a subject which is full of gradations from absolute black to strong, brilliant white, the developer should have such a proportion of pyrogallol as will give full density to the white, perfectly clear blacks, and the intermediate tones as true to nature as possible. If we find, as development proceeds, that the high lights are not developing black enough, we correct this fault by adding more pyrogallol. If they develop too strong, if the contrasts of light and shadow are exaggerated, we reduce the proportion of pyrogallol. So much for the function of the reducing agent in the developer—it controls density.

(*To be continued.*)

THIS is a "glorious climate," but its attractions are not great enough to cause us to forego the pleasure of reading the BULLETIN, so you will find enclosed $3 renewing my subscription from time of expiration.

F. E. PATTERSON.

THE DISPLAY OF APPARATUS AT THE BUFFALO CONVENTION.

The large exhibition building in which was displayed the apparatus, stock and competitive exhibits not included in the art gallery, was most admirably suited to its purpose, covering an immense amount of floor space and presenting large areas of upright space on the walls and partitions for the grouping of photographs, display of backgrounds, accessories, etc., all being well lighted and conveniently arranged, the spaces assigned to exhibitors being in almost every case either in rectangles of 31 x 44 or some well proportioned fraction of that size, such as a half or quarter of that area. The display as a whole was most satisfactory and comprehensive, though the number and importance of novelties did not equal the efforts of some former years. The first noticeable exhibit on entering the hall was that of our publishers, which occupied one of the largest spaces allotted to any one and which called forth many expressions of commendation, on account of the completeness of the exhibit and the taste displayed in its arrangement.

The most important novelties shown here were the Compact and Knickerbocker cameras, both of which are intended for view work, and each presenting valuable improvements over those of last year. The Compact is made on the same principle so often met in English boxes, which, when the camera is closed, converts the bed into a protector for the ground glass, and completes the idea of compactness by being provided with a carrying strap or handle, doing away with the necessity of a carrying case and rendering the instrument easily adjustable, strong and light and peculiarly portable. The Knickerbocker camera is one having excellent points, intended to serve all the purposes of the most expensive box, but so constructed as to cost less than any camera of its points in the market. Some improvements were shown in the Magazine camera over last year, which have tended to rectify little inequalities and errors of movement noticed in the working of some of the earlier boxes of this make. We were glad to see the table occupied by the BULLETIN attract the attention that it did, and to notice the large display of publications of the house with which it was adorned, thirty-four listed publications—in addition to Vol. IV of the "International Annual"—being represented on this counter.

Adjoining this display was that of the Blair Camera Company, so well known for the products they turn out, among which might be mentioned the English Compact, the Kamaret and Hawkeye cameras, and their very complete line of Taylor and Hobson lenses. The English Compact camera of this firm is a beautiful box, combining all the necessary movements in double swing, rising from telescoping bed and attached tripod head, and presents an appearance, as to finish and style, which is well worthy of notice.

Immediately at the left of the main entrance was located the exhibit of the Allen & Rowell dry plates, shown by the Blair Camera Company, among which were noticed a large collection of excellent work, including a number of subjects from negatives made by Mr. George H. Hastings, President of the Photographers' Association of America, particularly attractive from the variety of tones ranging all the way from brown to a rich deep black—all of which were printed on the Blair aristotype paper.

A number of enlargements from exposures on film and glass plates, made with the Kamaret, also added to the value of this exhibit.

Wilson, Hood, Cheyney Company, of Philadelphia, displayed a number of specialties, including Osborne's new folding backgrounds, both plastic and painted, Caswell's background holder, draperies, curtains, etc. The firm was represented by Mr. John G. Hood, and it was a matter of note to observe the harmonious blending of colors which may be obtained by a judicious grouping and arrangement of many colors as was here demonstrated.

Bradfisch & Hopkins showed a large collection of work printed on their Omega paper, which was of much interest, and embraced examples of the fine tone and feeling obtainable, both in plain and glace finish, when handled by an operator who knows how to work this paper.

The American Aristotype Company came next in order with a fine display of work, much of which was in that peculiar warm brown tone so pleasing to the educated eye, and which seemed to have been obtained without the usual filling of the shadows in this tone. An excellent display of frames, combining several tricky methods of mounting the print effectively, added much to the attractiveness of the exhibit.

The Bonte Frame Company displayed a large and varied assortment of frames, both oval and square. particularly adapted to photographic, crayon and colored portrait work—several in silver white color, finished without gloss, being of especial merit.

The K. & W. Automatic Printing Company presented a novel and practical machine for automatically printing bromide or quick emulsion paper in strips. By a single motion of the crank the paper is unreeled from the spool, exposed for a specified time to the light, cut from the roll and dropped into the reservoir ready for development. A vast number of prints may thus be made in an extremely short time and with the advantage of perfect uniformity of exposure, as the regulator once set, no difference in length of exposure is possible until it is changed. This apparatus is the most complete of its kind that we have seen.

E. A. Gilbert occupied an adjoining space and there demonstrated his new method of preparing one's own emulsion and paper for printing. Among his specimens were several panels which showed his method of transferring the print.

Frank Robbins exhibited his automatic print register and a very ingenious device for which he is the manufacturer's agent, called the Tubular Revolving Show Case, and which consists of a narrow, tall glass frame, divided into panels, for holding photographs, the whole frame being circular or barrel-shaped, driven by clockwork, and revolving on a pin at the bottom; the effect being to show all the contents of the frame in one revolution. The clockwork is constructed to run for fifteen hours without rewinding.

In the extensive display made by the Stanley Dry Plate Co. a series of 11 x 14 flash-light photos, by Pach Bros., attracted much attention, and served as an excellent commentary on the speed and quality of the plate used. A lot of interiors and some beautiful surf views, from the same artists, were much admired, as also a fine set of marines from the well-known H. G. Peabody, of Boston. One of the gems of the entire collection, however, was a series of landscapes made with a Detective camera by a lady amateur of Chicago, who not only evinced a truly artistic manipulation of the plates and paper at her service, but displayed a taste and discrimination in her selection of subjects, quite

remarkable. This exhibit was in charge of Messrs. E. B. Conant and E. E. Moore.

Landon & Kent showed a varied assortment of frames adapted to the use of the photographer, which, while they were artistic, did not introduce any novel or startling effects.

The Argentic Paper Co. exhibited, in connection with their paper, the Hoover Contact Printing Machine, for use with artificial light; and were represented by D. W. C. Hoover.

Tucker & Butts were located next, and their exhibit was noticeable for its tasty appearance and the fact that it was presided over by one of the lady assistants of the firm. Mr. Butts was in frequent attendance at the building, and when not there was more often than otherwise engaged in making himself of service to some of the many strangers who were only too glad to avail themselves of his courtesies. A feature of this exhibit was its enlargements and crayon and pastel work, in addition to the very full line of stock and apparatus.

THE DAGUERRE FUND.

To the Editors of Anthony's BULLETIN :

In looking over the list of subscribers to the Daguerre Memorial in your issue of July 25th, I notice the absence of my name and amount subscribed last September. As I was the mover of the motion to take up a further subscription and then draw on the Treasurer of the Photographers' Association of America and pay to Mr. Hartley balance due him, it might seem strange to some of my friends not to see my name in the list above referred to; but as I hold Mr. McMichael's receipt for $100 and the same was published by you in a list in your issue of November 8, 1890, page 668, I conclude the absence of the same in list of July 25th was an oversight of the transcriber from Mr. McMichael's list.

Your truly,

JOHN CARBUTT.

[We printed the list as received from the stenographer.—ED.]

PRINTING FROM NEGATIVES WITH GREAT CONTRASTS.

To the Editors of Anthony's BULLETIN :

In a recent issue I read a description of how to print a certain class of negatives which otherwise would not give satisfactory prints by the ordinary method of printing.

As the writer infers, it has been tried before. I, myself, have had occasion to, and have used this method of printing, principally in portraiture, and more especially with negatives of ladies and children in white dresses, when to get out sufficient detail in the white draperies the rest of the negative had to be covered.

Better (though not as convenient to make as an albumen or plain paper print) for this method of printing is a positive on a celluloid film, to make which I clean off a discarded negative made on an Eastman film. Then coat this film with collodio-chloride emulsion. Print to the required depth, and fix. When

dry this positive is exactly the size of the original negative, which is not always the case with the paper print, and it is more easily adjusted.

Photographers ought to be thankful to Mr. McGlashan for calling their attention to this useful dodge in printing. SAM WARDLEY.

OUR ILLUSTRATION.

WITH this issue of the BULLETIN we give some more examples of the charming studies of H. P. Robinson, of England, who was awarded a special diploma at the Buffalo Convention of the Photographers' Association of America, for just such work as we present in a reduced form to our subscribers with this issue of our journal. We regret that the reduction of the pictures has greatly marred their beauty, but the spirit of each subject can be well made out, and as motives for this class of work will undoubtedly prove useful.

SHUCKS—A CORRECTION.

BY some means or other the following lines of Mr. Hurd's poem were left out in the last issue of the BULLETIN. They should come just before the first line on page 470, which reads, "Who has won her spurs by valor":

A 'cute philosophic writer
Put it down that men noteworthy
In professions, or whatever
Would apply to their vocation,
The most modest appellation
They could find that would express it.
Acting on this hint, it maybe,
One—a lady—new among us,
Yet whose name is widely quoted,

I WOULD just remark that I was a subscriber up to about two years ago, when I discontinued the photographing business, also the BULLETIN, but lately I have commenced the business again and now I do not see how I can do without the BULLETIN, so send it along. G. J. S.

I ENCLOSE my check for $3, subscription for the BULLETIN for 1891, which you will please continue to send to my old address. I enjoy reading the BULLETIN and think it much improved in appearance this year.

CLEMENT LE BOUTILLIER.

I LIKE the BULLETIN because it gives the photo news and keeps a neat and compact form. JOHN G. DOUGHTY.

WE like to let our friends know we are alive and think the surest way to do so is through your photographic BULLETIN. GEO. E. GREENLEAF.

ENCLOSED find postal note for subscription to Anthony's Photographic BULLETIN. I have now been a subscriber for two years and have derived much pleasure and profit in improved methods and better results from its perusal.

A. GLASSELL, JR.

ANTHONY'S

Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA, 12th ANNUAL CONVENTION, BUFFALO, N. Y., 1891.

THIRD DAY.—(*Continued.*)

The film which is to receive the image, must be structureless, and sensitized uniformly; that is, it must be transparent, or at least only slightly opalescent and free from the grainy texture of the usual commercial emulsions. The ordinary wet plate well washed fulfills these conditions. Professor Lippmann has experimented successfully with gelatine, albumen, and collodion films, and either iodide or bromide of silver as sensitizers.

The plate is placed film side in against a U-shaped piece of rubber, a piece of ordinary glass is placed against the other side of this U, and the three are firmly clamped together, making a sort of trough, two or more millimeters through, which is filled with quick silver. The film and the metallic mercury are hence in contact. This trough is substituted for the ground glass in the camera, the sensitive film is in the plane of correct focus, a sufficient exposure is given, and the plate is developed in the usual manner. The brightness of the colors depends in great measure on the whiteness of the silver deposit. These colors do not appear until after the plate is dry.

Needless to say that these operations are carried on by a safe light, as the electric light is contained in a light, tight box, from which the beam issues through a shutter or door when needed. This particular specimen is an albumenized collodion film, sensitized in a 10 per cent. nitrate of silver solution. The entire field of the spectrum is exposed for three minutes without any interposing color screen. The total distance from light to plate is about one meter. It was developed with pyrogallic acid and sesqui-carbonate of soda until the entire surface of the spectrum was well brought out, which required about five minutes' time, fixed in usual hypo solution, very carefully and thoroughly washed, and the result is the exquisitely beautiful band of colors before you.

The principle of this production is explained by Professor Lippmann as follows: During exposure the beam of light has passed through the glass supporting the film, through the transparent film itself, and then reflected from the surface of mercury in contact back through the film, the reflected rays colliding, if I may so express it, with the incident rays and forming fringes of interference, that is, at those points within the film where both incident and reflected rays are in the same phase or direction of vibration a maximum effect of light is produced. Per contra, where the rays are in opposite phases, vibration is annulled, obscurity results, and there is absence of effect. The result on development is a series of infinitely thin laminæ or strata, with planes parallel to the surface of the film, each in thickness half a wave length of the color which produced them, and this same distance apart one from the other.

In a film say, one-twentieth of a millimeter thick (one five-hundredth of an inch), over 150 of such layers would result from the red ray, 220 from the yellow, and 250 from the violet. The colors, therefore, are not as pigments; they are but the decomposition of the white light by which the plate is viewed, and are analogous to the play of color upon a soap bubble or the iridescence of mother-of-pearl.

Mr. Gentile then exhibited the plate to the Association.

The *President*—We will now take up, under the head of Unfinished Business, the report of the Committee on the World's Fair,

Dr. Elliott, Chairman. Mr. Scandlin will report for him.

Mr. SCANDLIN—Your committee would report that owing to a lack of organization and means of obtaining information from the officers of the World's Fair in Chicago, your Committee has been unable to make any progress whatever in the matter for which they were appointed.

Mr. GENTILE—I would say that Mr. Douglas, the representative of that committee in Chicago, told me that he has nothing further to communicate to Dr. Elliott or the rest of the Committee further than what I mentioned here yesterday, that the exhibit at present is classified in the Liberal Arts Department and the exhibit would be in the main building, which we desire.

The *President*—The report of the Committee on the Permanent Home, Dr. Elliott, Chairman, will be read by Mr. Scandlin.

Mr. Scandlin read the following report:

REPORT OF COMMITTEE ON PERMANENT HOME.

In accordance with the resolution adopted at the Washington Convention your Committee beg to report as follows: From correspondence among the members of the Committee, it would appear that the best home for the Association would be one centrally located and sufficiently large to hold the best pictures from our Conventions, the unique inventions that come before us from time to time and at the same time easily accessible to the general public. In a word, a kind of Museum of Photographic Arts and Inventions. It is not necessary to have this at once, but it might be begun by having some small offices where these things can be taken care of until the Association can build or acquire a home worthy of the art it is founded to encourage.

As a central location the City of Washington has been suggested. This would be a good place for the public of the entire United States to see what the Photographers' Association of America is doing, for the number of visitors to the city is very much larger, and from a greater radius than any other city in the Union. Here, too, would be the place for an occasional Convention, say once in two years. Furthermore, it is probable that suffcient accommodation could be secured at as reasonable expense as in any other large city.

If the Association determines to start such a home it must also be remembered that a custodian of its effects must be secured, whose office should be, to a certain extent, a permanent one, say changeable once in five years.

Another plan suggested is to secure a lot in one of the cities of Chicago, Columbus, Indianapolis, or Cincinnati, and build a home for the Association, consisting of stores and offices and together with a hall for convention purposes. The stores and such offices as the Association does not need for its own use could be rented at reasonable rates that would be sufficient to pay interest on the investment. The capital for this enterprise subscribed for by members.

These are the suggestions of your Committee, and it hopes they will be fully discussed at the Convention.

In conclusion, your Committee would respectfully suggest that no steps be taken until sufficient money is subscribed for the carrying out of the project in a business-like manner, and at the hands of those who will give detailed reports of progress from time to time, as called for by the members of the Association. No matter what plan is adopted, money is necessary to start it, and some self-sacrifice on the part of those who take up the task.

Respectfully submitted,

ARTHUR H. ELLIOTT,
Chairman of the Committee.

The *President*—What action will the Association take on the report of the Committee on The Permanent Home?

Mr. RANGER—I move that the report be accepted and laid on the table for the present.

Seconded and carried.

The *President*—The next business in order is the disposition of the Daguerre memorial matter, which was submitted on Tuesday and postponed until this session. You have heard the report of the Chairman of the Memorial Committee and the remarks he made, to the effect that the Washington Convention empowered the Executive Committee to settle it after all efforts had been made to collect the money. We thought it better to submit a detailed report to you before taking the steps which we were empowered to take.

A member inquired how much was still due Mr. Hartley, and Mr. McMichael replied that a balance of nearly $3,000 remained unpaid.

The *President*—The balance in the treasury January 1, 1891, was $2,328.22. I think we have very good reason to believe that this Convention will be a financial success, but it will necessarily draw upon the amount received at this Convention to settle the balance.

Mr. GENTILE—I do not think all the means of collecting money have been thoroughly exhausted yet. Owing to some misunderstanding on the part of some of the different committees they did not do anything towards making collections. It seems very unjust to defer settlement of this matter any longer. The money ought to be paid. It is keeping Mr. Hartley out of his money too long; but at the same time, with proper energy more money might be collected. For instance, I was present at the American Conference, which represented thirty-five or forty different societies, and they had never had the matter brought before them. On speaking to many of the members, I found they knew nothing about this matter, but had no doubt that if it was brought before their different societies a very liberal contribution could be made, for many of the amateurs belonging to these organizations are great admirers of Daguerre and would willingly contribute if the matter were properly presented to them. The Camera Club of Chicago, for instance, never had the matter brought before them. This society is composed of a number of rich people, very much interested in photography, and I am satisfied they would have contributed something to the fund if they had known of it. I think there are a number of other societies in the country which would do the same thing.

The *President*—I think this Association would be most happy not to be obliged to draw on its resources to the extent which is apparently necessary. But it is not justice to the man who has done this work to keep him waiting any longer for his money.

The Executive Committee was empowered at Washington to settle it, but we thought it better to defer doing so until a detailed report had been submitted.

Mr. MCMICHAEL—Mr. Gentile speaks of some forty societies of amateurs, and that there was nothing done towards getting money from those people. I would say that those societies did not exist at the time the Committee was raising the money; but that there was a number of members that paid as high as $50 apiece towards the fund. It was impossible to get something from nothing. In Chicago, I believe, the Committee did not act at all; I don't think they raised anything there.

Mr. GENTILE—They never had a meeting.

Mr. BUSH—I would like to ask Mr. McMichael whether Mr. Hartley would not be willing to wait another year for his money. We would be able to pay him interest, no doubt, and at Chicago we will have a larger attendance, and members would be more willing to contribute. Times are rather hard just now. If we defer the matter two years, we could better raise the money to pay the balance.

The *President*—I would state that Mr. Hartley has been obliged to pay interest on notes for part of this monument for work which he had to have done.

Mr. MCMICHAEL—Mr. Hartley has paid out $900 more than he has received already, and he cannot wait any longer. The notes are out and are due, and he must have the money. It is not possible for him to wait any longer.

Mr. CARBUTT—I move that all members who have not subscribed be now given an opportunity to subscribe as much as they can towards the fund. There may be some here who desire to add to the fund, and I move that an opportunity be given them to do so, and when all is obtained that can possibly be collected, that a draft be drawn on the treasurer for the balance in the treasury with which to pay Mr. Hartley.

Motion seconded and carried.

Mr. CLARK—Mr. Carbutt's motion is very timely. I have heard some members say that they had not contributed to the memorial fund, and were desirous of doing so, and I understand that some of that kind are now present.

The *President*—We are glad to give them a chance to contribute. We will now receive any contributions which may be offered, and the Secretary will note them.

Mr. FRENCH—It might be well to state that there are many who would be willing to subscribe a dollar, but who, from the smallness of the amount, abstained from doing so. Let them understand that such a sum would be gratefully received.

The *President*—The original plan was a popular subscription of one dollar, and we had no question in mind but that each one given an opportunity would be quite willing to subscribe that amount. Amounts from a dollar upward will be thankfully received.

Mr. Seavey, in contributing $25 to the fund, said: "I feel under personal obligations to Daguerre, for he was a scenic artist, the same as myself, before he became the inventor of our present photography, and, of course, as you all know, a large measure of my success has been due to that invention. I have derived a great deal of benefit from that in an indirect way, and I should feel very much ashamed if this should go through without my name appearing in some way.

On motion, the President appointed Messrs. Adams and Estabrook a committee to visit the dealers present and collect further contributions.

The *President*—The Secretary will submit a report of the result obtained in the collection of contributions towards the Daguerre Memorial Fund, on Friday morning.

Mr. Gentile moved that a vote of thanks be tendered to Mr. LaManna, of Brooklyn, for the loan of the plate prepared by Professor Lippmann, and the communication which he (Mr. Gentile) had read, which motion was seconded and carried.

On motion of Mr. Clark the election of officers was postponed to the next session.

The following communication from Mr. H. A. Hyatt, of St. Louis, was read:

G. M. CARLISLE, Buffalo, N. Y. :

Dear Sir,—Herewith find $2 for my dues in Photographic Association of America, for which please give me credit. Kindly send me my badge. Oblige, H. A. HYATT.

N. B.—Hope the Convention will be a success, and am exceedingly sorry that I can't participate.

The Convention then adjourned until 2.30 P.M.

THIRD DAY—2d SESSION, THURSDAY AFTERNOON, JULY, 16TH.

THE Convention was called to order by *President* HASTINGS, at 2.30 P. M.

On motion of Mr. Clark, a vote of thanks was tendered to Mr. E. Long, of Quincy, Ill. for the donation of lantern slides, exhibited at the demonstration of the previous evening; and on motion of Mr. McMichael a vote of thanks was given to Mr. Hetherington for his interesting entertainment given on the same occasion.

The next business in order being the election of officers, the chair appointed Messrs Anthony, Endean and Bellsmith, a committee to prepare and distribute ballots.

The *President*—Mr. Stein having declined the nomination for the presidency other nominations will be in order.

The following nominations for president were made: Messrs Hastings (for re-election), Stuber, Hetherington, Rockwood, Ranger, Cook-Ely, Angel.

All of the nominees except Mr. Ranger, however, requested that their names be withdrawn, as they were unable to serve if elected.

Mr. PICKERILL—I wish to say a word right here. Let us, regardless of friendships and prejudices, nominate the best men, the men that will carry the greatest amount of influence, who are best known, and who can be looked up to with pride, as officers of this association. (Applause.) The next meeting is to be held in Chicago, where we will have dealings with the authorities of the World's Fair. We want intelligent men, and men who can stand up for their rights if they have to fight for them. (Applause.)

Mr. FRENCH—I would place in nomination a gentleman who has been connected with photography for fifteen years and with this Association for a long time. He has been identified with the manufacture of a particular useful photographic implement, but he has always been a practical photographer, and has recently sold his business, and has become a professional pure and simple. He possesses ability and the qualities necessary to the chief executive officer of such an Association as this, and if elected I know that this Association will be benefited by his conduct of its affairs. I place in nomination the name of Mr. W. G. Entrekin, of Philadelphia. (Applause.)

Mr. PICKERILL—I think that in the nomination of Mr. Entrekin the key-note has been struck. I heartily second that nomination. I hope that he will accept it and that his election will follow. (Applause.)

On motion, the nominations for the office of President was closed. On a vote being taken, the Secretary announced the following result: 169 votes cast; necessary for a choice, 85. Mr. Entrekin, 144; Mr. Ranger, 25. (Applause.)

On motion, the election of Mr. Entrekin, as President, was made unanimous.

Nominations for First Vice-President being called for, Messrs. C. Stewart and R. P. Bellsmith were nominated.

Mr. HUNT—Chicago is our next meeting place. The President is from Philadelphia. Our First Vice-President should live in Chicago. I therefore nominate Mr. Frank Place, of Chicago, for the office of First Vice-President. (The nomination was seconded.)

On motion, nominations for First Vice-President were closed, and on a vote being taken, the Secretary announced the following result: Total number of votes cast, 155, of which Mr. Place received 113, Mr. Stewart 32, and Mr. Bellsmith 20.

Mr. GENTILE—Mr. Place, who is not present, has requested me to withdraw his name. He says he appreciates the honor but must decline it.

Nominations for Second Vice-President being called for, Mr. Ranger nominated Mr. C.

Stewart for the office, which being seconded, he moved that nominations therefor be closed.

On motion, the rules were suspended, and Mr. Stewart was elected by acclamation.

The *President*—Mr. Overpeck has been nominated by the Committee for the next term, as Secretary. Other nominations are in order.

Mr. Gentile was nominated by Mr. Glines.

Mr. HAMMER—I have the honor to present the name of Adam Heimberger as a candidate for the office of Secretary of this Association. He is a well-known photographer and business man, and very popular throughout this city. He is representing some of the most important photographic interests in the country, and has been an officer of several photographic societies. He is also a director of a prominent bank of this city and is treasurer of one of its foremost commercial enterprises. He is a man who will serve you well, and is a man of whom the Association may be proud as its Secretary.

Motion seconded.

On motion, further nominations for the office of Secretary was closed, and the election postponed until the next session.

President HASTINGS (addressing the President Elect)—Mr. Entrekin, the Photographers Association of America have elected you to be their President for the next two year? Will you accept the office?

Mr. ENTREKIN—I will, and I will try to do all I can towards making the next Convention a thorough success. This Mr. President and ladies and gentlemen, is certainly an unexpected honor, and I sincerely appreciate the confidence you have shown in me by electing me to fill this important position. I am a worker and not a talker. I can assure you that as long as the gavel is in my hands, I will see that you receive equity and justice. (Applause.)

On motion of Mr. Sperry, the Secretary was instructed to cast the affirmative ballot of the Association for the election of Mr. Carlisle as Treasurer for the ensuing term.

The *President*—The election of officers having taken place, the reading of papers is now in order.

I will first call upon Mr. Ames, who will make a few remarks concerning the saving of silver waste.

Mr. AMES—Mr. President, ladies and gentlemen: In addressing you on the subject which the President has announced, I do so extemporaneously, having no paper prepared for this occasion.

The matter of saving silver waste may appear to be very simple, but it is not. It is easy enough for us all to make waste, and make it in abundance if we have plenty of business, but to save waste requires some skill. It is easy to earn money, but to save money requires financial genius. It is just the same in the saving of waste. I suppose that not more than 1 or 2 per cent. of the nitrate of silver that is used in photography and the arts enters in permanently to the material for which it is used. I suppose that by a careful saving, with chemical knowledge carried into practice, that 90 per cent. of all the silver that is used can be recovered. Out of that, of course, comes the expense of the recovery. It would seem a very simple thing to save paper waste, for all there is to do is to lay it to one side until the refiner comes along; but there are ways in which the paper waste can be saved, and by which it will yield a photographer a larger percentage of profit, and that is, to save the paper waste as clean as possible, by not allowing foreign matter to get into it. A great many people, having the idea that it is all going to be burned and refined, think it makes no difference what gets into it, if the refiner only makes it pure. But the foreign matter which you add to the paper waste makes it a great deal more refractory in the refining, especially if you allow mounted cards to get into it, or if you burn your waste yourself and burn those mounted cards. Clay enters into the manufacture of cards, so that is equivalent to mixing up earth with your silver. It requires extra expense, extra heat, and extra time in order to refine such waste, and then there is a greater loss by way of a small percentage and sometimes a large percentage of silver being carried off into the slag. Therefore, to save paper waste profitably, save it as clean as possible. The best way is not to allow any to go on to the floor at all, nor allow anything to come in contact with it which is soluble.

Many people have an idea that my blotters are richer than my albumen paper, and they think they ought to be allowed a better price. We get blotters varying from good for nothing to quite rich. Very recently I refined two batches of blotters from two different galleries in St. Louis. One batch of 50 pounds yielded 38 and a fraction ounces of metallic silver, avoirdupois. From another batch of 33 pounds we recovered 3 and a fraction ounces. So you see there was a great difference. Blotters are heavy, and when you put my blotters on to the scale to balance your

albumen paper, you have a great deal more paper over the surface of the albumen than you have in the same weight of blotters. You may have an equal amount of silver in the same amount of surface, but when you come to put on enough albumen sheets to balance the same surface of blotter, it takes several of them to weigh down your blotter.

As to the saving of wet waste. The best method to employ for this is to put the wet waste print washings, hypo and gold, and all, into one receptacle. If you are using a barrel, put it into that barrel ; if you are running on a small scale and using a stone jar, put it into that. But in case you put the two together never use anything but the sulphuret of potassa for its precipitation. You cannot precipitate silver held in solution by hypo with salt or hydrochloric acid, unless you use hydrochloric acid in excess, so that you neutralize your hypo, but that is not advisable. Sulphuret of potassa is the best thing.

In the saving of print washings, if you attempt to save them separately from your hypo, and precipitate with salt or hydrochloric acid, which is the same, the fluid forms chloride of silver, it is the chlorine of the salt that throws it down, and it is the chlorine of the hydrochloric acid. In those cases where your silver solutions are exceedingly weak, you add water, and you run in water as though you had an ocean at command. Now, to illustrate, supposing that you take one grain of silver and put it into a thousand gallons of water. Now bring a re-agent to test that silver, and you have not silver enough to make a test. It is too delicate and it would be hardly possible, with the most skillful means, to discover that you had that one grain of silver in it. Now, we will take a solution of 60 grains in strength. We add the salt or the hydrochloric acid, as the case may be, and form a chloride of such gravity that it goes down like a rock. In that case, where your solutions are strong, your precipitation was thorough, but your test was exceedingly weak, the chloride that is formed has not sufficient gravity to fall. It is therefore held in suspense, and you fail to get it down. If you were mixing the two, your silver washings and your hypo, you are increasing the percentage of silver, and then, sulphuret of potassia being a more thorough re-agent, your silver goes down more effectually. Your gold can be put into the same place also, because sulphuret of potassa is a re-agent for gold as well.

Ever since the Creater said: "Let there be light," and there was light, the world has been advancing, and nature has never stood still. So when the photographer first seized upon the ray of light, and put the harness upon it, photography has been continually advancing. While you are advancing in this art, do not be behind, I beseech you, in the skill of saving or recovering your waste. If I could have put into my possession to-day the waste that goes to waste entirely beyond recovery, in all the galleries of the United States, I would have a sufficient amount to retire and live like a king.

Many people who undertake to save waste are not skillful in it. They are very careful about a few pounds of clippings, forgetting that the biggest part of the sheet of albumen is mounted upon cards, the silver washed out, to go down the gutter, while a few trimmings from the sheet are saved. Now, there is a difference in the quality of waste. We can refine waste for two neighbors, who live side by side. Both samples may be perfectly clean, pure as can be, but one will return far more to the pound than the other. Now, there are reasons for this. They both may be silvering with a solution of the same strength, but there is a difference in the weight of paper more or less per ream. There is a difference in the porosity of paper, a difference in the atmospheric conditions, a difference in the temperature, and all these differences make the paper vary, and more silver will enter into some kinds of paper under certain conditions than enters into others, so that we get from clean waste in recovering metallic silver all the way from four-tenths of an ounce to the pound to an even ounce to the pound from paper scrap.

I want to say a few words regarding the quality of wet waste. Now, we will take wet waste from certain cities, and different lots will vary. I have before me now some that come from photographers doing business in St. Louis. I wish to say that the precipitations we get from St. Louis will run from 10 to 20 per cent. less silver to the pound than they will in samples from Cleveland. Now, what is the reason for this difference? Because in the City of St. Louis, many of the photographers are using water that is muddy, and these muddy deposits are received with the silver, so that a large percentage of earthy matter gets into the savings in St. Louis, while in Cleveland the water is more pure. But no water is really pure except it be chemically pure distilled water, thoroughly distilled. Many photographers think because they get distilled water, coming from some factory, running through iron pipes, carrying oxide of iron, that being distilled water it must necessarily be pure, while really it may not be as good as the riley water to be obtained in the street. No distilled water is pure unless it be thoroughly distilled in an elongated pipe carried through a worm, either of block tin or glass, and then if the steam is driven too fast, or unless the distance is far enough, you are carrying organic matter off with the water. You have to be very careful in the distillation of water, in order to have it chemically pure.

(*To be continued.*)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—C. W. T. writes: I have taken the BULLETIN for some time, and it always seems ready to help one out of trouble, and has got to be quite an old friend. Will you please inform me through the columns of the BULLETIN what phosphate sodium is used for in photography, and does it ever go by any other name? I have received a bottle, which was sent to me by mistake, and I do not like to return it if it is anything I can use to advantage. I do not find it mentioned in any of my printed solutions and up to this time have had no occasion to use it.

A.—Phosphate of soda is sometimes used in the toning bath, where it gives dark purple tones if used immediately after mixing. Here is a formula for a bath for albumen paper:

Gold chloride	1 grain.
Phosphate of soda	20 grains.
Water	8 ounces.

The following is for a combined toning and fixing bath:

Ammonium sulphocyanide	25 grains.
Hyposulphite of soda	240 "
Phosphate of soda	15 "
Gold chloride	1 grain.
Water	2 ounces.

After adding and dissolving the first four salts in the water add the gold chloride. The chemical name for ordinary phosphate of soda is disodic hydro-phosphate or hydro-disodic phosphate. It is an alkaline salt, hence its use in the toning bath.

Q.—F. C. F. writes and incloses two prints: I have had no instruction in photography, and send you these prints made from two negatives taken with a French portrait lens. The prints were made with ready sensitized paper without fuming. Please tell me what you think of the work.

A.—The negatives are very good for landscapes taken with the lens you mention. The prints would be very much better if you had fumed the paper. The red color of the prints is due to the preservative used in it, and the fuming overcomes this tint.

Q.—A. W. B. writes: Will you please answer the following questions through the proper column in the BULLETIN? In developing my plates, after the high lights are about half up the plate quits developing, and I can get nothing more out of it. Will you tell me how to stop this, also what is the cause? I never had trouble like this before, so that I do not know what to do to prevent it.

A.—Your trouble appears to be under-exposure. Try giving the plates a little more time or use a larger diaphragm. Perhaps you have got a slow batch of plates put into a box marked rapid.

Q.—Inquirer writes: Please give me the following information through the columns of the BULLETIN. How are opal prints made suitable for water-color work? I mean direct prints. What books can I obtain that will give this information and to make opal portraits?

A.—If we understand your question, you must obtain opal gelatine-bromide plates on which to make your prints, and then it is a question of mixing your colors for the tinting. Grinding the colors with a weak solution of gelatine works well with some artists, but it is greatly a matter of practice, some using the water-colors direct with water only as a vehicle. For further particulars, see Wilson's "Quarter Century of Photography," page 497; it can be obtained through our publishers.

Q.—J. O. S. writes: I have tried a number of times from here to get a view of the Olympic Mountains, and have had no success; they are quite a distance away, 'tis true, but ought to make a small showing on a plate it seems. I have tried all ways imaginable and they will not come out, though I can see the faintest outline on the plate. I have used snap shots on Cramer's and Seed's, and timed exposures on Carbutt's orthochromatic. My lenses are Dallmeyer's Rapid Rectilinear. A $6\frac{1}{2} \times 8\frac{1}{2}$, and one 12×15. Now, can you help me out; ought the plate to be a slow one or just the opposite, with the quickest snap of a Prosch. I have been an amateur for a number of years, but never had occasion to take a view like this, and it's floored me completely, the foreground of the picture is water, then the narrow streak of hills about 8 miles away, then back of these are the Olympics nearly 75 miles, but they are above the hills about $\frac{1}{4}$ of an inch, partly covered with snow. I have taken the BULLETIN for a number of years, but never remember of seeing anything in

reference to this subject in it or any of the different year books. I once saw an account of some one, I believe, in Tacoma or Seattle, who had got a good view of these same mountains from there, he used orthochromatic plates, if I am not mistaken?

A.—With such subjects we have had best success with Vogel's eoside of silver plates as sold by our publishers. We have not used them at such long range, and would suggest the use of a color screen either in the lens or in front of it. Be sure that the sides of the color screen are parallel or the picture will be distorted. Remember also that these plates are rather slow themselves and the use of a screen makes them still slower.

Views Caught with the Drop Shutter.

PRINTS AND PHOTOS NOT MAILABLE.—Instructions have been received from the Treasury Department at Washington to more rigidly inspect dutiable mail matter. Everything except books will be seized as contraband.

The construction formerly put upon an act of Congress, passed March 3, 1879, has allowed all printed matter from foreign countries to be mailed to New York. Other United States ports have not been so liberal and confined the mailable matter to books. The circular issued by the Treasury Department, dated July 28th last, orders the seizure of all printed mail matter except books.

This applies to the various kinds of printing processes, such as hectographs, half-tones, etchings of all sorts, photo-engravures, as well as engravings. Photographs have hitherto been allowed to pass, but they will be seized in the future. Americans will hereafter have to send their photographs by express, or redeem them at the Collector's sale of contraband mail seizures.

A "parcel post" service has been established by special arrangement with such countries as do not supply an express service. Printed matter, as well as some other packages, can still be sent in the mails to this country from Jamaica, Barbadoes, Canada, Honduras, Mexico, Hawaii, Leeward Islands, United States of Columbia, Salvador, Danish West Indies and Costa Rica.

GUSTAVE THIELKUHL, chief photographer of the Treasury Department, has just received from Director-General Davis a commission appointing him chief photographer of the World's Fair. Mr. Thielkuhl is a young man of ability and experience, and is pronounced an artist of the first class. All official pictures of the exposition will be taken under his personal direction. He will leave for Chicago on Tuesday.—*Chicago Inter-Ocean.*

MESSRS. LANCASTER and Corey, of Cedar Falls, have been commissioned photographers of the Iowa Columbian commission, and will soon put teams on the road to take views. They will have 7,128 different views on exhibition at the World's Fair, an average of seventy-two to a county.

These views will show the scenery and buildings of different counties, giving strangers a good idea of the topography of the State. —*Dubuque Herald.*

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PHOTOGRAPHED BY
HARGRAVE & GUBELMAN,

NEGATIVE ON ALLEN & ROWELL DRY PLATES.
PRINTED ON N. P. A. PENSÉ ALBUMEN PAPER.

U. S. FLAGSHIP "CHICAGO."

FROM THE ORIGINAL PAINTING
- BY -
FRANKLYN BASSFORD.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. SEPTEMBER 12, 1891. NO. 17.

FALL FOLIAGE AND ORTHOCHROMATIC PLATES.

THE approach of fall and its beauties in the way of foliage should turn the thoughts of the photographer to the use of orthochromatic plates. When we look around and note the number of photographers that use ordinary plates on the richly-colored landscapes of autumn foliage, we often wonder if they have ever seen the same landscape taken with a good orthochromatic plate. If they have not they should try such a plate and we promise them that they will not soon return to the use of the ordinary plate.

We thought that the knowledge of the use of orthochromatic plates and their mode of working was pretty well written out, but we were very much surprised to hear a gentleman otherwise well posted in matters photographic express surprise at the wide difference between the use of orthochromatic plates and those of ordinary manufacture when used on colored objects in nature. He further was surprised that the manipulation of the plates was so easy and not very different from the ordinary varieties.

The fact of the matter is no one would use ordinary plates if they only knew how much better results can be obtained with the orthochromatic brands. There is only one drawback to the last-named plates: they are slow after the lightning speed attained in some of the best brands of modern dry plates. Yet who wants to take a landscape or a portrait at such speed except under special circumstances? As a rule time can always be taken in these cases and with infinitely better results even with ordinary plates.

As is now well known the principle of orthochromatic photography was first enunciated by Professor H. W. Vogel in the year 1873, when in the "Photographische Mittheilungen" he stated (page 236):

"From my experiments I believe I am pretty safe in saying that we are able to render bromide of silver sensitive to any desired color; or we may exalt the sensibility to certain colors which it already possesses, if we add to the bromide of silver some material which assists the decomposition of that compound, and

which at the same time absorbs that color and not the others. In this manner we are able to remedy the photographic inactivity of certain colors hitherto troublesome."

Since this principle was discovered, a number of coloring matters have been proposed as sensitizers for the photographic plate. As a matter of fact, only those colors that are derived from the group called "Eosins" have been found practically useful. They absorb the yellow and orange rays of the spectrum, and assist the decomposition of the bromide of silver when these rays fall upon its surface. These coloring matters act best when used in extremely small quantities, and when incorporated in the emulsion when it is prepared.

The effect of the plates is to render the colors of the objects to be photographed in their true relation of shade; thus, red letters on a black ground would come out as black as the ground, but with an orthochromatic plate the letters would come out lighter than the ground, or as they appear to the eye. Mr. G. Cramer puts the matter in such good shape in his paper read before the Photographers' Association of America, that we cannot do better than quote his words:

"Let us imagine a landscape before us; above, the blue sky with white clouds; on the horizon, the distant hills; in the foreground, foliage in the beautiful shades of autumn. The ordinary plate would take the sky white, being just as sensitive to the light blue as to white rays; and, therefore, will show no clouds unless they are of a darker shade. The distant hills would only be faintly visible, and the foliage be lacking in detail. The orthochromatic plates would give us a soft, gray sky, not white, but with beautiful white clouds; the distant hills just as distinct as you see them in reality, and the foliage, with all the various gradations, from the finest high light to the deepest shadow, every leaf being clearly detailed, and every blade of grass standing out from the rest. In all it gives us just what we see with our own eyes, except the colors. For portraits, we will consider we have to photograph a pretty, rosy-cheeked girl from the country—rosy-cheeked, but a little freckled, with a blue dress and yellow trimmings, and with auburn hair. The ordinary plate will give her a fair face, but what a job to retouch all the freckles! The blue dress will appear like a white one, the yellow trimmings will be too dark. Her hair will show a great lack of detail, and appear the same as black hair. While the other plate will give, if anything, a bolder, rounder image; freckles will not be visible to a greater extent than you can see them with your eyes, and, in the portrait, are generally smaller than the original, as they are almost entirely invisible. The hair will be of a medium shade, and as full of detail as that of a brunette. The dress will be of a proper tone, the yellow trimmings in harmony with the rest."

This puts the matter in a nutshell, and from experience, we can fully indorse his statements.

In regard to the keeping qualities of the plates, we have the testimony of such men as Vogel, Eder, Leon Vidal, Bothamly, and others in Europe, while at home, the words of the veteran dry plate maker, John Carbutt, given at the Buffalo Convention last month, leave nothing to be desired on this score. This is what Mr. Carbutt says:

"When I commenced making the orthochromatic plates in 1886, many scientists and amateurs in this country were experimenting in orthochromatizing

the commercial plain dry plate, and while good results can be obtained by this method, it was found that they lacked the important quality of keeping, and this fact being made known through the photo journals, led many photographers to believe it applied also to the commercial made orthochromatic plates; but I am able to state most emphatically, as a result of personal experience and experiment, that the orthochromatic plates made from emulsions containing the color sensitizer have just as good keeping qualities as those made from plain emulsions."

From what we have stated it is evident that orthochromatic plates are the only ones to be used for taking pictures of colored objects, and for use in autumn landscape work they give results not to be approached by any other plates hitherto made for the photographer. In copying colored pictures containing blues and reds, a color screen of orange shade is necessary, and also in taking pictures of distant mountains. In both the last cases more time is necessary than when the screen is not used.

Try the orthochromatic plates, and if you use them rightly you will not soon abandon them.

EDITORIAL NOTES.

A FORMULA for a new developer, recently discovered by M. A. Noel, of France, which is said to possess all the good qualities of the best hitherto known agents, with very few of their faults, is as follows:

Sodium sulphite	50 grams.
Sodium hydrate	1 gram.
Sodium carbonate	140 grams.
Kinocyanine	10 "
Water	1,000 cc.

The name "kinocyanine" has been given the new agent from its close resemblance to vegetable cyanine and quinone. It takes the form of small, irregular crystals, and is soluble in water, alcohol or ether.

REFERRING in his annual report, to the large collection of very valuable negatives now belonging to the Observatory, the director of the Harvard College Observatory urges the importance of having provided for them, a fire-proof storage house, wherein they may be kept with greater safety than at present. An addition of almost 9,000 subjects has been made to the collection during the past year, which brings the total number up to about 27,000, a great many of which are invaluable to science. It is to be hoped that this suggestion will be speedily carried out.

THE Society of Amateur Photographers of New York have availed themselves of the offer of the American Institute to occupy the entire second floor of the Fair Building for a free exhibition of the work of its members. The exhibits will be classed as follows: Portraits, landscapes, marines, instantaneous and enlargements, and competition is open to all members of the society without charge. The exhibit will be open from September 30th to November 28th, and fifteen bronze medals will be awarded to the successful competitors. All correspondence regarding entries, etc., should be addressed to T. J. Burton, Chairman Committee of Arrangements, 113 West 38th street, New York.

According to A. Lainer, a new stable salt of gold and potassium, containing no free acid, not deliquescent, and of the same strength always, may be made by dissolving 100 grams of pure gold in aqua regia. The gold should be cut into small pieces and carefully placed in flask. Mix the aqua regia and add only a small quantity to the gold, heating by the water bath till all action ceases, then pour off the solution, add fresh acid and continue till all gold is dissolved. Heat the solution in a flask and add 38 grams of chloride of potassium, dissolved by heating in as little water as possible, and allow to stand till the crystals have formed, when the liquid should be poured off and the crystals heated to 100 degrees C. to expel the acid. The salt thus formed will contain 51.99 per cent. of gold and 19.96 per cent. of chloride of potassium, having the formula $AuCl_3KCl$.

The California Camera Club announce an exhibition of club work for the second week in September. They have also on foot a project to form an annual prize print competition for members of the club, with special premiums for progress, and it has even been suggested that such a competitive interchange by the various clubs and societies of this country and Canada might be inaugurated to advantage. We shall be pleased to see such a scheme perfected and carried into execution.

We notice in looking over our advertising matter for this issue that a new application for photography has been found in a method by which its reproductions may be burnt in on the surface of porcelain, china and material of like nature, and in welcoming the Photo Ceramic Company to the field of reproductive work we would prognosticate that they will find ample opportunity for exercising their art to their material advantage.

Our acknowledgments are due the Boston Camera Club for a copy of their by-laws and constitution with list of officers for 1891, by which it appears that Henry N. Sweet is President; Francis Blake, George M. Morgan and S. Henry Hooper, Vice-Presidents ; Wilbur C. Brown, Secretary, and F. Alcott Pratt, Treasurer. The whole is very neatly printed and a credit to the club.

Advance sheets of a very interesting book by C. P. Duchochois, entitled "The Photographic Image," give promise of a most readable and valuable addition to the literature of the art. The treatment of the subject in hand by one so well able to handle it, is exhaustive and comprehensive, and we shall be glad to review it more fully when it shall have appeared in due form. The author has our best wishes for his success, which we believe to be most deserving.

A new club has been formed in Helena, Montana, with prospects of a successful career. Its officers are Leslie Sulgrove, President ; Geo. C. Sharp, Vice-President, and A. G. Lombard, Secretary and Treasurer.

Following in the footsteps of M. Lipmann, of Paris, many amateurs and scientific men have been experimenting in various fields, one result of which, obtained by Mr. W. Ainsley Hollis, being the discovery that if a glass plate or other suitable substance coated with phosphorescent calcium sulphide be ex-

posed similarly to an ordinary plate, only for a longer time, a phosphorescent negative is produced which may be transferred to any other sensitized film showing distinct colors. This statement should prove of sufficient interest to give some one a cue for experiments that may prove of value to the art in time to come.

We note that the Brooklyn Academy of Photography have decided on leasing new quarters which will within a few weeks be put in condition to make them a comfortable and commodious home.

Our thanks are due and hereby tendered to Professors S. W. Barnard and J. M. Shaeberle, of the Lick Observatory, for their most valuable and interesting report of the total eclipse of the sun as observed and photographed by them in Cayenne, French Guinea, S. A., December 22, 1889. The report is embellished with several views of the eclipse, and many others of the instruments and surrounding objects, which make it of unusual interest and must serve to bring back to the memories of those who participated in the events chronicled, many pleasant reminiscences.

A new departure in the preparation of photographic films is brought forward by M. Planchon, whose method is to flow the emulsion on a thin metal frame, which supports it till development is completed, when it is discarded. Its practical working qualities are awaited with interest.

A formula for intensifying negatives for photo-mechanical work, which is said to work excellently, is as follows:

A.

Bromide of potassium	¼ ounce.
Water	4 ounces.

B.

Sulphate of copper	½ ounce.
Water	4 ounces.

Mix equal proportions of A and B, and flow on the plate till thoroughly whitened. Blacken with nitrate of silver, 30 grains to the ounce, or hyposulphite of ammonia 1, water 4 parts.

Mr. George A. Nelson, of Lowell, is to be congratulated on having been one of the ten successful Americans whose pictures were hung at the late International Exhibition at Vienna. When it is remembered that over four thousand prints were put in competition and only six hundred hung, of which only ten were by American artists, Mr. Nelson may well feel proud, as no doubt he does.

An enormous projecting microscope is about to be manufactured in Munich by M. Poeller for the Columbian Exhibit in Chicago. The light will be furnished by electricity which, by the aid of an aluminum reflector, will equal 11,000 candle power. The heat generated will be overcome by an ingenious arrangement by means of which carbonic acid gas will be distributed to the various parts of the mechanism, and the power of the lens, which under ordinary conditions will amount to 11,000 diameters, will be augmented by vaseline oil immersions to 16,000 diameters.

At a recent meeting of the Brooklyn Academy of Photography a life-size bust of Daguerre was unveiled which was presented by the Société Francaise de Photographie to the Academy, together with portraits of Poitevin, Fox Talbot, and Nicephore Nièpce. The meeting was an enthusiastic one, and the gifts are prized very highly by the recipients.

Dr. E. Vogel finds that the sensitiveness of plates is very greatly increased by even the slightest traces of chlorine, bromide or iodine in the resorcin or pthalic acid residues of fluorescein; and he has also demonstrated that the bleaching of eosine coloring matters in light is not due to oxidation, but to some other cause.

A REVOLUTION IN SILVER PRINTING.

BY W. JEROME HARRISON, F.G.S.

There are five points needed for success in any printing process which is to attain success at the present day :

First.—It must be permanent.

Second.—Easy of manipulation.

Third.—Capable of accurately reproducing the character of the negative.

Fourth.—Of good color—and of a range of color if possible.

Fifth.—Cheap, or at least not dearer than ordinary silver printing on "sensitized albumenized paper."

It is, perhaps, impossible to obtain all these points to perfection in any one printing process ; but I certainly think that Dr. W. W. J. Nicol's new patent, entitled : "Kallitype No. 2," embraces more good points than any other printing method with which I am acquainted.

But before considering its claims, it will be better to describe the "New Kallitype" in theory and in practice.

The original Kallitype process, or "Kallitype No. 1," as patented by Dr. Nicol in March, 1889, consisted in brief of paper coated with a ferric salt, which, when exposed to light beneath a negative, was partly reduced to the ferrous state showing as a faint brown image. The exposed paper was "developed" by floating it on a solution of silver nitrate with sodium citrate and ammonia. The citrate dissolves the ferrous salt, and this then attracts and reduces metallic silver from the silver nitrate. The principle is thus exactly the same as in the platinotype process. An image is formed in iron, and this iron image is then converted into one of silver.

It will be seen that this "Kallitype Process No. 1" involves the use of a silver bath, which imparts a black stain to the fingers. To avoid this, and also to give the power of obtaining warm tones, Nicol has within the last few weeks devised the method which he calls "Kallitype No. 2," and which it is the object of this paper to describe. In this second process the silver is put on the paper along with the iron. The patent is not yet completed, so that the precise details cannot be given, but the paper is coated with a mixture of silver nitrate, silver oxalate, ferric nitrate, ferric oxalate, and nitric and oxalic acids. The coated side has a yellow appearance, looking, in fact, precisely like commercial platinotype paper. It is important that the paper should be kept dry and that it should be exposed to light as little as possible; but in both these respects no

extraordinary precautions are necessary, nothing more than the care which any careful worker always bestows upon the handling of ordinary silver-sensitized paper. The pads used in the printing frames should, however, be thoroughly dried previous to use.

Printing with the new kallitype paper is a very rapid process. About three minutes in sunlight, or ten minutes in diffused light, is sufficient to produce the faint brown image (just showing detail in the high lights), which is all that is required.

Development must be conducted according to the tones which are required; but any tint from yellow through red to purple and black can be obtained. For sepia tones make up the following developing bath:

Rochelle salt	½ ounce.
Borax	1 dram.
Hydrochloric acid (strong)	5 drops.
Water	10 ounces.
Bichromate of potash solution (20 grains to 1 ounce)	10 drops.

In all developing and toning processes it is our habit to use distilled water and pure chemicals; but these are not specially necessary, though, of course, advantageous, in kallitype.

For Purple Tones.

Rochelle salt	1 ounce.
Borax	4 drams.
Water	10 ounces.
Bichromate of potash solution (20 grains to 1 ounce)	10 drops.

For Black Tones.

Rochelle salt	1 ounce.
Borax	1 ounce.
Water	10 ounces.
Bichromate of potash solution (20 grains to 1 ounce)	10 drops.

By a mixture of these developing solutions a great range of tones can be obtained; but those which range from purple to black will be most generally preferred. For the sepia tones the exposure must be much increased, so that the image is fully and distinctly visible in brown outlines before development.

Development can be effected by simply floating the paper upon the developing solution, but it is better to completely immerse it; and for this reason, that the solution is not only a developer but also a fixer; it dissolves and partly removes the iron. The prints should be left in the developing solution for not less than ten or fifteen minutes, and should be frequently moved about.

The Rochelle salt is the principal agent; it is, chemically, potassium-sodium-tartrate; the borax serves to influence the tone of the print. To insure the complete removal of the iron salts (which cause the paper to appear yellow) we have found it a good plan to remove the prints from the developing bath to a bath consisting only of a 10 per cent. solution of Rochelle salt, and to allow them to soak there for ten minutes.

Air-bubbles are often seen on the prints while in the developing solution; but these are easily removed by a touch of the finger.

The bichromate of potash serves to increase contrast; and for prints from weak negatives the quantities given above may be increased by one-half. Too much bichromate, however, destroys the half-tones. Development should

be conducted in a subdued light, or by gas light. The quantity (ounces) of solution given above will develop two or three dozen whole-plate prints; but the cost of the chemicals is very small, and it is recommended to use plenty of solution, or the prints may have a yellow tint when finished. The picture will appear almost instantly the print is immersed in the developer; but it should not be removed for at least fifteen minutes, as the solution fixes as well as develops.

Although the developing solution assists in the fixing also, yet it only half does the work, and the prints must be removed from it to the fixing solution proper, which consists of

Strong ammonia	4 drams.
Water	1 quart.

The prints should remain for a quarter of an hour in this ammonia bath, and we prefer to remove them from this to a second ammonia bath of like strength (in which they may remain for ten minutes) in order to insure pure whites and perfect fixation.

Finally, the prints are washed in running water, or in several changes of water, for about fifteen minutes. They may then be dried in clean cloths or in blotting-paper, and are ready for mounting.

And now let us consider how far this new kallitype meets the requirements which we stated at the commencement of this paper.

The two great obstacles to the permanency of ordinary silver prints have always been considered to be the albumen on the paper, and the hyposulphite of soda used for fixing. Kallitype dispenses with both of these evils. But as many still prefer the glazed prints produced with albumen, there has just been placed "Albumen Kallitype Paper" on the market. We prefer, however, the more artistic tones produced on the ordinary paper. For "Kallitype No. 1" an unsuitable paper was used for a short time, and the prints faded; but this was not at all the fault of the process. "Kallitype No. 2" has been submitted to many chemical tests, and has come well out of them. It is true that the unquestioned permanence of platinotypes cannot be claimed for kallitypes; but that they are far more permanent than ordinary silver prints is equally certain. It is fairest, perhaps, to compare kallitypes with bromide prints, as in each case we have an image in metallic silver produced by development; but the kallitype has an advantage over the bromide print in that no hypo has been used to fix it.

The manipulation is extremely easy. Only two baths are necessary; and it is possible to print, develop, fix, and wash all in less than one hour.

The tones and gradations of the prints are extremely good. The appearance of the finished print is equal to that of a carbon print or a platinotype.

The prints cost only half as much as platinotypes. The paper is sold in cut sizes, and also in sheets.

Dr. Nicol is at present engaged in still further perfecting his process, and it is possible that before long he will present us with "Kallitype No. 3" in the form of a printing-out process, which will require nothing but a simple wash in weak ammonia after removal from the printing frame.

Along with this paper I send two or three rough prints done in "Kallitype No 2" for the editor's inspection and opinion. Considering the youth of the process, I hope that he will admit that my title is correct, and that we have now the possibility of a "revolution in silver printing."

[The prints sent are very fine and closely resemble platinotype.—Editors.]

THE COLLODIO-ALBUMEN PROCESSES.

BY P. C. DUCHOCHOIS.

THE first collodio-albumen process was devised by Taupenot in the hope of obtaining a more reliable and sensitive dry photo-film than those then in use—1855.

Originally it consisted in coating a plate with a collodion simply iodized; then, after sensitizing and a good washing, to eliminate the silver nitrate in excess, with a solution of albumen, or better, of fermented albumen also iodized with 1 per cent. of potassium iodide, whereby the silver iodide held in the collodion film being rendered insensitive to light, or nearly so, the plate could be kept for a very long time. To excite it sufficed to dip it for a few seconds in a bath of aceto-nitrate of silver, then to wash off the excess of this salt, when, after drying, the plate was ready for exposure. As usual the development was effected by gallic acid solution to which was added a little of the sensitizing silver bath.

This collodio-albumen film is no more sensitive than the albumen film when both hold the same silver salt.

Here the writer cannot refrain to remark that it is really very strange that, having as an example the daguerrean process showing that the sensitiveness of the photo-film is tenfold exalted by silver bromide conjunctly with the iodide, the inventors of all the photographic processes, calotype, albumen, collodion, prepared the sensitive film without this salt, and that most of the first photographers following their original directions and on the authority of the best writers, amongst them the author of "Photographic Chemistry," for a long time adhered to the simply iodized preparations.

How many wrong statements which led the beginners astray were published in those early days of photography by persons who seem never to have experimented with the processes they spoke about! Has it not been said that Ferrier and Soulier albumenized the plates *in puris naturalibus* to avoid dust? And on this queer saying how many amateurs and, perhaps, professional photographers were deterred from working the best known diapositive process? Dust is no more annoying in preparing plates with albumen than with a gelatino-silver bromide emulsion. It suffices, as we have said in describing our albumen process,* to sweep the operating (dark) room with wetted sand, and to copiously sprinkle it, when in half an hour or one hour the room will be free from dust swimming in the air. And as the albuminizing is made by white light, any particle of dust which accidentally may fall on the film can be seen and removed before equalizing the film or placing the plate in the drying box.

The improved Taupenot process—that is, with an alkaline bromide added both to the iodized collodion and albumen—was a favorite among French photographers, although complicated by the preparation of the double film, until Madam Lebreton suggested the use of plain instead of iodized albumen, and to wash the excess off. The albumen is consequently employed as a preservative, the collodion photo-film remaining sensitive to light.

This process gave rise to many improvements, amongst which are those of Fothergill, Maxwell Lyte, Pestcher, Mann and Sebastian Davis, who published, in 1878, a process which we shall describe. It yields good and brilliant negatives, and can advantageously be employed to obtain diapositives for the magic lantern, etc.

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* Page 456.—In the formula of the toning-fixing solution, page 459, there is an erratum in the proportion of sodium thiosulphate. One should read 38 parts instead of 8 parts.

The process we have now to describe is a true albumen process, in which plain collodion serves as a support for the albumen film. It is not an improvement, far from it, the preparation of the plate being complicated by the previous collodionizing, etc., and the double film being liable to produce certain defects.

This process, I think, I have been the first photographer to devise. I was at that time (1857) in Utica, giving lessons in photography to Mr. D. D. T. Davie. He wanted to learn the albumen process in order to photograph the beautiful falls of the Black River, six in number, occupying at intervals a picturesque ravine, about two miles long, near the village of Trenton Falls, N. Y., and from the negatives to make transparencies for the stereoscope. Not having a drying box at hand, it occurred to me to prepare the plate with a thin film of plain collodion, and after immersing it in water until greasiness had disappeared, to coat it with bromo-iodized albumen, etc. I succeeded well, but on many plates the film blistered badly and slipped out. The remedy was, of course, apparent. It sufficed to edge the plate and to use a porous collodion.

The pyroxyline which always has given me excellent results in the wet collodion process as well as in the preparation of dry plates, both by the bath or emulsion process, and which I recommend for the process in question, is obtained by the formula following, which I published in the BULLETIN many years ago:

Sulphuric acid, commercial, 66 degrees Baumé	5 pints.
Nitric acid, commercial, 41 degrees Baumé	4 "

Temperature, 140 to 145 degrees Fahr.
Time, from 10 to 12 minutes.
Cotton, as much as the solution will cover well.

The pyroxyline prepared by this formula can be dissolved to the extent of more than 8 grains to the ounce of alcoholic ether, 1:1, giving a structureless porous film, specially well adapted to hold a great proportion of silver bromide if employed for emulsion, which is indeed a great desideratum when the image is developed by the alkaline method, since the intensity depends on the layer of reduced metallic silver which itself depends on the thickness of the silver haloid coating.

For the albumen process presently described, a collodion prepared with 1 part of pyroxyline for 100 parts of alcoholized ether answers quite well.

If one objects to the preparation of the pyroxyline, we recommend the photographic cotton manufactured by Charles Cooper & Co., or, in lieu, an old colored collodion, the iodide not interfering with the results, for it is washed off when the plate is immersed in water to eliminate the ether and alcohol.

The best protection against blisters, etc., is an albumen substratum. It is prepared by dissolving the white of one egg in a pint of water, adding one or two drams of aqueous ammonia and filtering through paper.

The *modus operandi* of the process is as follows:

The glass plate is placed in a very strong solution of washing soda for an hour, then rubbed under the tap with a stiff brush, then well rinsed, drained, and, while wet, twice flowed over with the substratum, and lastly placed on a rack to dry spontaneously.

The plate is now coated with collodion, and as soon as the film is *set* immersed in water until the liquid flows evenly over it. It is then allowed to drain, and as soon as the collodion film is surface dry, but still damp, it is coated

twice with the bromo-iodized albumen and left to dry on a rack in a place quite free from dust.

The formula for the albumen preparation is given, page 456, together with that of the silver bath employed for sensitizing.

I have been asked what is the action of zinc nitrate, which is one of the constituents of the silver bath. It is simply added in place of a certain quantity of silver nitrate to effect the coagulation of the albumen.

In the same formula are added 2 per cent. of glacial acetic acid instead of 10 usually recommended. The latter proportion I have always found exaggerated. Often I have acidified with only one part of acetic acid or replaced it by a few drops—3 or 4—of nitric acid. In fact it suffices that the bath shows an acid reaction to litmus paper.

Sensitized, the plate is washed as directed, page 457. Excessive washing considerably impairs the sensitiveness. It is not necessary. It does not much increase the keeping qualities of the film, for albumen necessarily forms with silver nitrate an insoluble not well defined compound, termed silver albuminate, which, like all the organic salts sensitive to light, progressively undergoes alteration even in the dark, unless a preservative compounded with an alkaline bromide be applied on the film.

As to the development, fixing and toning, I have nothing to add to the instructions given, page 457 and seq., except that no good results should be expected by the alkaline development by reason of the thin layer of the silver bromo iodide.

This and the pure albumen processes are now specially employed for diapositives. The process due to Mr. Sebastian Davis can also be employed for negatives. It gives very fine results, but it is far from being as sensitive as the modern gelatine process.

Coat the plate—previously prepared with a substratum—with a good bromized collodion, sensitize and wash in distilled or rain water, until greasiness has disappeared. Rinse then with fresh water, and having flowed over the preservative several times, wash the film copiously and allow it to dry.

PRESERVATIVE A.

Silver nitrate	6 grains.
Distilled water	1 ounce.

B.

Clear albumen	3 ounces.
Raisin extract	3 "
Aqueous ammonia	90 minims.
Ammonium chloride	45 grains.
Distilled water	3 ounces.

Mix A to B.

The raisin extract is prepared by crushing or tearing open 1 ounce of raisins and pouring over 5 ounces of boiling water, allowing the whole to become cold before filtering.

The development is effected by the alkaline method after wetting the film. When the picture is sufficiently visible, and the details well out, intensity is obtained by continuing the development with acidified pyrogallol and silver nitrate in the usual manner.

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

DEVELOPMENT.

By Prof. R. Hitchcock, *of the Smithsonian Institute, Washington, D. C.**

(*Continued.*)

Next as regards the alkali. The alkali starts the action of the reducer and controls the progress of the reduction. It is therefore a natural consequence that the stronger the alkali the more energetic the action will be. It also follows that if a plate be insufficiently exposed for an ordinary developer, it can be fully developed by one containing more alkali. The only limit to the proportion of alkali is the resistance of the film of gelatine. Gelatine softens when treated with a strong alkaline solution, but if we could make sensitive films with some substance which alkalies would not affect, the necessary time of exposure could be greatly reduced. The limit would then depend upon the stability of the silver compound itself. We therefore conclude that a normal developer should contain such a proportion of alkali as will bring out the lights and shadows of a picture in their true relative intensity. For an under-exposed plate use more alkali; for over-exposed, less.

Thus far all is clear enough, and were it not for a very remarkable, and as yet unexplained, action of light upon sensitive silver compounds, the process of development would always be a very simple operation. This apparently erratic action of light is a reversal of the primary effect which is brought about by continued exposure. If, for example, it requires three seconds to produce a good negative, an exposure of somewhat longer duration—perhaps of ten seconds—will yield a positive picture. A still longer exposure causes a second reversal, and we get a negative, after that another positive. A practical demonstration of these effects is by no means easy, because we do not know, except from numerous trials, how long to make the successive exposures. I have seen the first reversal several times, on plates brought to me by others; but they have always been accidental and a source of great astonishment to those who made them. The same result can also be produced by a momentary exposure of the plate to diffused daylight after proper exposure in the camera.

Now as to the bearing of all this upon development. It is obvious that reversal by over-exposure involves a reduction of density in those parts of a negative which should be nearly opaque, since in the reversal these must become the thin or transparent parts. We observe this effect in its incipient stage very frequently in our negatives which have thin skies. Thin skies are the result of over-exposure of those parts of the negative. They cannot be avoided when there are deep shadows in the subject. Only when exposures are very quick do we get clouds in our pictures, because the sky and cloud light is so very strong that all gradation of light is lost on the plate. If we expose too long upon the subject itself the same reversing effect begins, and while the high lights grow thin by over-exposure (reversal) the shadows grow stronger and stronger, as the weak light acts for a longer time. Thus our difficulties multiply, for it is impossible to give always a correct exposure, and even if we could do so, there are often such strong contrasts in our subjects that before the shadows are well exposed the high lights tend toward reversal. The negative will therefore be flat and thin. This effect must be controlled in the development, and with certain limits this is possible. We have seen that pyro controls density, and alkali

* From author's corrected report.

the energy of the action. Now over-exposure for a strongly alkaline developer may be under-exposure for a very weak one. Therefore, knowing that the plate is over-exposed, use a developer weak in alkali, that it may act slowly, and use an extra proportion of pyrogallol to give increased density. Under-exposure is treated in the opposite manner. In this the contrasts are too strong. The high lights are usually exposed veiy well. They develop black and opaque. They should therefore be brought out with weak pyrogallol. But the shadows do not come out well; therefore use stronger alkali. We observe, therefore, that the special efficacy of a developer, whether for common work or for particular purposes, depends upon both the absolute and the relative proportions of its two principal constituents. If now you ask me to give a formula for the most perfect developer for amateurs, I would say that it is not possible to choose between many in use.

There is another compound of great value in development, but since it is not an essential constituent of the developer we will dismiss it with a few words. I refer to bromide. The action of potassium, sodium or ammonium bromide is quite the same. The bromide restrains the action of the developer. If we use a bromide we must also use more alkali than would be necessary without it. To a great extent one may avoid the use of bromide by reducing the alkalinity of the developer. But the chemical action of bromide is too complex to permit of discussion at this time.

We now come to the third mentioned constituent, the sulphite of soda. The influence of sulphite upon the process of development may be neglected in this discussion. It is used primarily as a preservative of the solutions. An alkaline solution of pyrogallol rapidly absorbs oxygen from the air and becomes dark red. When mixed with a due proportion of sulphite this change is prevented or retarded. By the use of an excessive quantity of sulphite, developers can be made to keep for a long time. This is the secret of preparing the solutions which are sold in the shops: they contain very much sulphite. The question then arises, how much sulphite should be used? I would reply, just as little as possible. I have experimented some upon the point, and I find that a proportion of one part of crystallized sodium carbonate to $1\frac{2}{3}$ parts of sulphite (in crystals) will keep the solutions in good condition during prolonged development, and prevent yellow staining of the film.

But I never keep a pyrogallol developer mixed, nor even a solution of pyrogallol. The proportion of sulphite recommended will not preserve the color indefinitely in warm weather. My stock solution consists of sodium carbonate and sulphite dissolved in water, and when required for use I weigh out the necessary quantity of pyrogallol and add it to the solution. It dissolves instantly, and thus the strength of my developer in pyro is always known. There is no deterioration and loss of pyrogallol by keeping. For amateurs this plan possesses great advantages. Not only is there economy to recommend it, but the composition of the developer is always under control.

I believe I was the first to recommend a strong solution of sodium bisulphite as a preservative for the developer. A saturated solution of sodium carbonate in water is first made. Through this a current of sulphurous acid gas is passed until no more is absorbed. The solution thus prepared is preserved in small (1 or 2 ounce) glass-stoppered bottles. About 1 dram of such a solution added to 10 ounces of developer (if my memory serves me right) will preserve the color perfectly during development.

BROMIDE ENLARGING.

BY G. D. MILBURN.

[Demonstration before Buffalo Convention of the Photographers' Association of America]

Ladies and Gentlemen,—My purpose this evening is to make a practical demonstration before you of enlarging a 5 x 7 cabinet negative up to a 25 x 30 bromide print on Eastman's Permanent Bromide C Paper, using the arc electric light as means of illumination.

This to some of you may look a needless exertion, inasmuch as by chance you do not use bromide paper in your studios, and therefore perhaps you think you would not care for it, because you may argue "so many of the so-called cheap photographers use it;" be this as it may, many of our very best photographers in this country as well as Europe are producing exceedingly artistic effects, and to great advantage to their ledgers, therefore needless to say of great advantage to themselves.

Enlarging on bromide paper ought to be of interest to all of you, because a good enlarging process is a great desideratum in every first-class photographic studio, though not having had the advantage of using a process of this kind, some of you may not feel its necessity.

It is a well-known fact that in the average of cases small size negatives give better satisfaction to patrons of photographic studios than larger ones, and there are many reasons for this, in which the lenses used play no small part, causing more or less distortion, to a much greater degree in large work than in small; the operator is more accustomed to small work, it takes less time of exposure, and costs less if a small plate is spoiled, therefore perhaps more willing to try it over if the first sitting is not up to your usual standard; many other reasons could be enumerated in support of my assertion that prints from large negatives, as a general rule, do not give as good satisfaction as prints from small negatives.

Having produced a good small negative which pleases the sitter, it is a very easy matter, by using a little honorable business tact, to sell your customer a good artistically enlarged picture from the same negative. Or will you argue, "a photographer has not the same right to call attention to his goods that other respectable business men have;" or perhaps you will say, "it is not necessary to call especial attention to our large work, for our customers are aware of our facilities for producing that class of work before entering our studios."

The latter is no doubt true in many cases, but experience has taught every first-class business man in the land that their goods must be prominently brought to the attention of customers and the public time and again if success shall be theirs. In other words, I contend that while you practice photography as an art it behooves you to also practice it as a practical business, and with that end in view I wish to call your attention to the bromide process as a very valuable auxiliary.

A very successful method of introducing large work, as practiced by many, is to have an enlarged print ready for the purpose of showing to the previously selected customer when the small contact prints are called for, then by slipping the said enlargement into a convenient, suitable passepartout or frame, explaining in the meanwhile the different styles in which the enlarged picture can be finished, such as crayon, oil or pastel, a sale will invariably follow, and if

occasionally no sale, the loss in cost of material for making up the print is very trifling indeed.

While on the subject of frames, I wish to show you what enormous difference it makes to large bromide prints to be appropriately framed. (Exhibiting.)

Also the difference one hour's crayon work makes on a good bromide print.

When first the bromide process was introduced in this country there was much speculation rife as to the permanency of bromide prints, but this has ceased now, for it has been conclusively proven, when bromide prints are properly made from good permanent bromide paper they are as permanent as any other photographic prints whatsoever.

To prove this, I call your attention to Professor H. S. Stames, of London, experiments (See *British Journal of Photography*, November 11, 1887), and we have many other's substantial evidence in corroboration of this statement; besides we have our own tests and experiments.

When the bromide process was first introduced in this country many photographers went into using it, some only to soon give it up, claiming it was much more difficult than they had anticipated. This was chiefly due to the great degree of latitude of possibilities in results as well as the different methods which can be adopted to secure good results; from a strong negative it is possible to produce either strong or soft prints and the same from a soft negative. (This I will endeavor to show more fully in my demonstration.)

This yielding flexibility of the process proved a stumbling block to some of the busy photographers on their first attempts; however, the demand for Eastman's bromide paper has been on the steady increase from year to year, the last year being the largest in sales of any of its predecessors.

Some photographers use successfully hydroquinon and also eikonogen as developing agents. After extensive experiments we have concluded that iron oxalate is the very best developer for bromide prints. However, I concede there is more latitude in the actual development with the two former developers, inasmuch as the operation can be commenced with weak developer, increasing in strength as it is found necessary. On the other hand, with the oxalate developer we get a purity of white and black unattainable with the others.

To proceed with the demonstration:

If upon examination of the negative to be enlarged it is found difficult to determine the correct amount of exposure to be employed do not venture to expose a large sheet of bromide paper, but as a guide, place in position on the easel a small piece of bromide paper; that is, after the image has been thrown up to the proper size and focused sharp, then expose and develop.

If daylight is used for exposure, care must be taken to permit as little time as possible to elapse between the exposure of guide and print, as the light is apt to vary, making your guide useless. On dense parts of the negative extra time can be given on the same plan as vignetting, and very deep shadows can easily be held back by means of a shaped card on the end of a strip of glass.

The amount of bromide solution used in developer has great influence on the quality of bromide prints. For weak negatives the amount of bromide solution can be doubled or trebled to advantage, and for strong negatives it can be reduced to half or a quarter the normal amount. However, with fresh, normal developer some bromide solution ought always be used, or a merely mottled deposit may occur in the print.

To insure permanency, care must be taken to remove all the iron solution after development by washing thoroughly with acid solution, and all light excluded until the print is thoroughly fixed in the hypo, and the final washing must be very complete.

The apparatus necessary for bromide enlarging, as you see is very simple, a camera, lens and easel being the most essential parts.

Daylight is very good for enlarging, giving a smooth, even illumination. However, when a large quantity of work is to be provided for, the arc electric light is most convenient as it is powerful and practically uniform.

CARBON PRINTING.*

BY J. HEDLEY ROBINSON.

[A Communication to the Newcastle-on-Tyne and Northern Counties Photographic Association.]

Of all the processes, that of carbon or pigment printing seems to be the least known to members of our Association. This is to be regretted, as it is a method simple and beautiful in its working and beautiful in its artistic results—in fact, it is the only process which embodies in itself the necessary elasticity to suit the artistic requirements of photographers, as the color and surface of the finished print can be varied according as the class of work requires, whilst the absolute permanence of the results is undoubted. It is now more than a quarter of a century since the first photographs in carbon were produced by Mr. Joseph Wilson Swan, or by his process, and these are still to the fore, untouched by the action of light, or chemical or other actions which have been the cause of the fading away of so many once beautiful silver prints. The basis of the process is the action of light on bichromatized gelatine, which it renders insoluble, and not only it, but any coloring matter it may contain.

Carbon, or autotype, tissue, as it is called, is prepared by coating paper with an emulsion of gelatine and permanent pigment of the color required. After drying it is made sensitive by immersing it in a 5 per cent. solution of bichromate of potash, and when again dry is ready for placing under the negatives. But a much simpler plan is to purchase it sensitive, ready for the printing frames. In process of manufacture the Autotype Company render it sensitive to light by the incorporation of the bichromate, with the result that the least interesting and only troublesome part of the proceedings is avoided, and users have the assurance that the tissue is in its best working condition, which it will retain for a fortnight from the date of manufacture stamped on each packet.

Before printing, the negatives must have an edging of black varnish, an eighth of an inch wide, all round on the glass side to form a safe edge, the function of which is to keep the margin of the tissue quite soluble, to prevent the edges of the picture from washing up in development.

As the progress of printing cannot be seen we must regulate that time by an actinometer, which is a box with a glass lid, on which are several tints of graduated densities; a slip of sensitive silver paper is pulled under these, and the box and the printing frames are exposed to light. An average negative will take about two tints of Burton's actinometer, which is the one we have got here, and which you will see has six small negatives. When the second lightest of these is printed to the ordinary depth the tissue will be sufficiently impressed.

I have here pieces which have been so printed, and we will now proceed to develop them. Here I must mention there is no gold bath or hypo bath used in the process, only clean water. First, pieces of the temporary support, which is waxed prepared paper, are soaked till limp in cold water, then the tissue is also put into cold water, and

* From author's proof.

when it has nearly flattened out again, after first curling inward, it is put on to the support, both being under water, and then both are lifted out together by the finger and thumb of the left hand. Now we place them upon this mounting block and scrape out the water from between the surfaces. You see they now adhere together, and thus we will leave them for a few minutes. The action commenced by the light is continued in the dark, so that the development ought to be effected as soon as possible after printing, say, from one to three hours, or an allowance has to be made. Advantage can be taken of this continuation of action when the prints are known to have had too short an exposure; these, if left over night, will be found to develop the same as if they had the correct exposure.

Now let us develop our prints which we left upon the temporary support; we place them in warm water at 105 degrees, and in a few seconds, when the colored gelatine begins to ooze out at the edges, as you see, we skin off the paper on which was spread the compound in the first instance, and leave the greater portion on the temporary support. In this is embedded our picture, and by dashing the warm water over it, allowing it to soak a little, and again dashing it, the picture reveals itself. It is properly developed when dark-colored streaks cease to run from the print. If it has been over-exposed, as this one was done purposely, we have only to increase the temperature of the water, say, up to 115 degrees or more, and we can perfectly reduce it, as you perceive. If under-exposed we finish the development in cooler water and save the picture. Thus you see there is a very great latitude in this carbon process. When finished to our satisfaction, we give it a rinse in cold water and transfer it to a 5 per cent. solution of alum, which after ten minutes' action will free it from all traces of the chromic salt, and will render the gelatine quite insoluble.

Some of you might ask why the picture could not be developed on the paper of the tissue itself. This was a great stumbling-block to the early experimenters who tried it and failed. Because, as was argued, the light acts from the surface backward toward the paper, leaving a delicate insoluble skin on the surface of the tissue (which, although not interfering at all with the brilliancy of the finished print, seems to hold the gelatine during development, preventing it breaking up) and varying degrees of solubility in its thickness according to the different densities of the negative, whilst that portion of the tissue next the paper is left almost wholly soluble, and that, therefore, if the picture is to be developed that can only be done by dissolving away those portions of the tissue not acted on, or only partially acted on, by the light, and this can only be done from the back. Now I particularly wish you to notice the evolution of the simplicity of the process as now worked. After the above theory was propounded, the first step was to coat a sheet of glass with bichromatized gelatine compound; this, after exposure, was coated with collodion, and then put into warm water, which attacked the soluble gelatine next the glass, and the picture floated off in a film held together by the skin of collodion. This was caught on a piece of paper, and the development of the picture finished. This was a somewhat difficult process, and I do not think ever got beyond the experimental stage. The next link in the chain was when, about 1862, Mr. Swan took out patents for improvements. Eventually he spread the gelatine compound simply on paper (like what we see here), and, after exposure, coated the surface with India-rubber solution, and mounted it on to a piece of paper coated in a similar manner by passing it through the rollers of a copperplate press. This enabled the paper of the tissue to be skinned off (as we have done to-night), and, after development, left the picture on the India-rubber paper. It was, of course, a reversed one, and to overcome this he made a transfer paper with plain gelatine treated with alum; this, after softening in warm water, was laid upon the picture, and when dry the India-rubber temporary support was peeled off after moistening with benzine, thus giving the picture in its proper position. This was a perfect process, and by it some of the finest photographs have been produced. But with its heavy copperplate press, its messy India-rubber solution, and the use of the pungent benzine, it was hardly suited for

general photographers. So when, about 1868, Mr. Johnson, one of the founders of the subsequent Autotype Company, simplified it yet more, a great boon was conferred upon the photographic world. He found that no cement at all was required to fix the exposed print on to any support, but that it was enough to lay down the wetted tissue on an airproof and waterproof surface, remove the air and water from between the two surfaces by the use of the squeegee, as we did, and it would adhere by atmospheric pressure, caused by the vacuum created, in the same way as a boy's sucker or "clagger" sticks to the stone which he wishes to lift.

Now we will take our prints from the alum solution. We notice they are reversed. But as the support has been waxed with a solution of resin and beeswax in turpentine, which allows the picture to be eventually stripped, we will take a piece of this final transfer paper, which has been soaking in a 2 per cent. solution of alum for about an hour, place it and the print in water, bring them out together, place them on the mounting board, squeegee them, and hang them up to dry. When thoroughly dry they can be easily stripped off, leaving the support ready again for use after waxing. The support may be opal glass, when the print will take its mat surface.

This is the double transfer process necessary for ordinary negatives. A simpler one is the single transfer, but this requires reversed negatives or film ones printed from the reverse side. In this case the support is prepared paper without the waxing, and the print is finished as soon as developed, alumed and rinsed.

It will be seen that the finished prints are composed of insoluble gelatine, of the nature of vellum, in which is imbedded a permanent pigment, and is of all the processes, platinotype perhaps excepted, the only one that can be absolutely relied upon for permanence.

In conclusion, I may say all patents for this process are run out, so that any who wish may use it without let or hindrance.

FURTHER NOTES ON SILVER PRINTING.

BY LYONEL CLARK.

[A Communication to the Camera Club.]

My contribution of this evening to the proceedings of our club will partake rather of the character of desultory notes than that of a fixed paper, as I propose to give you the benefit of what further experience I have gained in a year's working of the process I described before you on December 19th last, and also to more fully develop the process of intensifying my silver prints, which I merely foreshadowed on that evening.

Beginning with the support or paper that is to receive the print, I mentioned that I had just received a batch of paper from Messrs. Reeves & Sons, known as "Arnold's pure unbleached," but had not had time to experiment with it. Since that date I have, however. been able to give the paper a thorough trial, with the result that I certainly find it superior in quality, or, perhaps, I should say purity, to any of the Whatman papers. The rough quality shows a rather decided diagonal surface grain, to which personally I do not object, although others may; but the smoother qualities, of course, are quite free therefrom. It is, however, on account of its great purity that I chiefly prefer it, for I have hardly met with a single instance of metallic impurities, or, indeed, any imperfections in the paper. I am unaware whether there is any difference in the sizing of this and the Whatman paper, but I am inclined, from its behavior, to believe that there is.

With the Whatman I have frequently, indeed almost universally, found patches of the paper that refused to soak up moisture, and remained comparatively hard and dry, even through the toning, fixing, and washing baths. I cannot say that there was anything dangerous about the appearance, nor, indeed, was it at all visible on the face; but I always had a sort of feeling that these patches might be portions of coagulated sizing and silver, to which the hypo could not get proper access, and which, therefore,

would remain as patches of hyposulphite of silver, or silver chloride, only waiting the proper temptation to burst out into nuclei of discoloration or areas of fading.

I must confess that up to the present they have not been led into temptation, or the temptation has not been strong enough, for I have failed to trace any harm to their presence. But, nevertheless, the freedom that the Arnold paper appears to possess from them is, in my estimation, another plea for its adoption.

Coming now to the sizing and salting baths, I find but little to change in my formulas. The quantity of gelatine I have recommended is doubtless high, as indeed is also that of the salt, but the amounts are intentional, as it is essential to get as vigorous an image as possible, if we wish to have a good black-and-white picture left after toning.

I have personally almost discarded the use of arrowroot or any other sizing agent than gelatine; or, if I do use it, I make it up fresh each time. I find that if the arrowroot mixture be allowed to stand, all the colloid principle appears to settle down to the bottom, and the clear liquid that is decanted off is little better than salt water. Used fresh, arrowroot is, however, very useful, but it is difficult to get it to the right degree of viscosity; if too thick, it dries in streaks on the paper, especially when the solution is cooling, and unless one does use it as thick as possible, it will not remain sufficiently on the surface of the paper. Therefore, for the rough papers, or those requiring a maximum of sizing, I have discarded arrowroot in favor of gelatine. But for the smoother quality of paper it can be advantageously used of a strength of about 18 grains to the ounce, or 1 in 25. This strength is practically about as thick as you can get it to lie on the paper evenly, and may, of course, vary with different samples. The solution should be used fresh each time, and the paper floated on it while it is still quite hot—in fact, it should be kept hot by the addition of hot water to an exterior dish, making, in fact, an impromptu sort of *bainmarie*. I find no filtering to be necessary. If the dish be covered to a depth of a half inch, any impurities will sink to the bottom, or, if left floating will come off if a trial piece of paper be used to skim the surface.

Gelatine should also be used as hot as possible, at least when coating rough paper; and the strength of 24 grains to the ounce, or 14 grams to the litre, has given me the most satisfactory results. I am afraid I did not make it sufficiently clear, either in my pamphlet on "Platinum Toning," or in my paper before this club, that it was necessary to apply the gelatine, when used in such strong solutions as I recommended, in as hot a state as possible. If the smoother variety of paper be used, such a proceeding is not so necessary, but with the rough papers it is essential that the gelatine should be very thin and liquid, so that the excess can freely run off the surface of the paper and not lie in and clog up the interstices between the granulations. With the above strength of gelatine, it must be used quite warm to do this, and therefore I now make a practice, if I have many sheets to salt, of keeping the bath warm by immersing it in another larger dish that I supply from time to time with hot water.

Unlike the arrowroot bath, the gelatine one can be used over and over again, the jelly that forms when the solution cools being each time redissolved by the application of heat. In fact, the bath remains good as long as the jelly remains a jelly when cold; when the mixture shows signs of becoming watery and losing its viscosity, the gelatine is beginning to perish and rot, and should be thrown away.

I have quite discarded filtration also with gelatine, and use instead a pretty deep layer of the liquid, when the heavy impurities will sink to the bottom, and the lighter ones will be taken up by the first piece of paper floated, which should therefore be a waster.

If anything, I am inclined to think that for summer work, or for hard negatives, the strength of the chloride given is too strong, and I now usually reduce it to 6 grains per ounce, or one in seventy-three, but for feeble negatives the 8-grain bath can still be used.

As a general rule, too, I use the simple chloride bath, and keep the mixed citrate and chloride one when very vigorous prints to give very black images are required. For the benefit of those who were not present at my last lecture, I will here repeat these formulas of salting baths.

For average negatives from spring to autumn:

A.

Chloride of ammonium	120 grains,	14 grams.
Water	1 pint,	1 litre.

For feeble negatives, or for winter light:

B.

Chloride of ammonium	160 grains,	19 grams.
Water	1 pint,	1 litre.

To these baths a crystal of soda carbonate about the size of a pea should be added to insure their alkalinity.

To obtain very vigorous prints, or for weak negatives or very feeble light:

C.

Chloride of ammonium	120 grains,	14 grams.
Carbonate soda crystals	240 "	28 "
Citric acid crystals	60 "	7 "
Water, up to	1 pint,	1 litre.

With all these baths the amount of gelatine to be used is:

For	Grains.	Grams.		Grains.	Grams.
Rough paper	240	28			
Not hot-pressed	120	14,	or arrowroot,	180	21
Hot-pressed	60	7	" "	180	21

These quantities are per pint or litre of liquid.

Coming now to the application of the salting solution to the paper, I now invariably use the floating method as the most suitable and easy. It is true that most heavy, rough papers will be found to be very repellent of the liquid, and when floated will at first refuse to take up any of the solution. But I get over this difficulty by brushing some of the hot salting solution over the surface of the paper before floating it. For this purpose I lay the paper face upward on a board, and with an ordinary broad camel-hair brush apply a fair amount of the hot solution, as evenly as possible to the surface of the paper, and then leave it lying on its back whilst the preceding sheet is floating on the bath. This procedure effects a double object; it not only makes the paper take kindly to the bath, but causes it also to imbibe a certain amount of moisture, and, therefore, to lie nice and flat on the bath. I usually float the sheets for three minutes, and while one is being floated, a second is being brushed over and left ready for its turn.

With regard to the drying of the paper, I have nothing to add, except to reiterate the statement that they should not be dried in a cold place; in fact, the hotter the drying room the better.

Failures in Salting.

With the system of preliminary brushing there is but little danger of leaving places or patches untouched by the salting solution, a somewhat common fault, and the only other danger to be avoided is that of allowing any solution to get on to the back of the print. For some time I was troubled with insensitive, or nearly insensitive, spots on the prints when they left the printing frame, of a faint lilac color, surrounded by a halo of darker color than the rest of the print. Sometimes these markings would take the form of a line right across the print. The cause of these markings I have now traced; they are entirely and solely caused by some of the salt-

ing solution getting on the back of the print and soaking through when it joins, so to speak, the salting solution on the face. This, therefore, creates a maximum quantity of chloride at this spot, and therefore the silver, when applied, is insufficient to convert all this chloride into silver chloride and still leave an excess of nitrate, and therefore insensitive spots are formed. The darker nucleus also is due to the excess of silver chloride at this spot, for since, generally speaking, the darkening is proportional to the amount of silver chloride (providing some nitrate be always in excess), darker patches are formed where this happens. These dark patches, as a rule, only show when, from insufficient floating or a weak salting bath, there is an insufficiency of haloid chloride on the print, as it is evident that if the maximum amount of chloride be applied in the first place, no further addition can make any portion of the print more sensitive or prone to darken. Such places will then either not show at all if an extra amount of silver has been applied, or, if this be deficient, they will show as white, insensitive, or nearly so, spots. In any case, however, the greatest care should be taken to avoid any of the salting solution falling on the back of the print.

In my last paper I made a few remarks on the two systems of floating or soaking the paper in the salting baths, and can strongly confirm my first view on the subject. With heavy drawing papers I find floating by far preferable, the method of soaking being a very wasteful and risky proceeding, nearly always requiring double sensitizing.

Silvering or Exciting the Paper.

I have but little to add or extract from my previous remarks. I still find brushing on to be far the most economical and expedient manner of applying the silver, and I find the modified form of Buckle brush I described in my last lecture to be a most valuable aid, and I am greatly pleased with its performance.

I have not found it necessary to make any change in the silver baths I recommended, for they each have their use. For feeble negatives or dull light, or if I intend to tone with gold, I use the Hardwich ammonio-nitrate bath described in my paper on "Platinum Toning" (*Camera Club Journal*, November, 1889). But for the generality of my work, and especially for the intensification process I shall describe later on, I use the silver citrate bath; the plain nitrate bath I have practically discarded, as it possesses no special advantages. The citrate bath is made up as follows:

Nitrate of silver (recrystallized), 60 grains	14 grams.
Citric acid (crystals), 25 grains	$5\frac{1}{2}$ "
Water (distilled), up to 1 fluid ounce	100 c.c.

Paper brushed over with this bath keeps fairly well, and when printed can be kept almost indefinitely before toning. I came across the other day a piece of this paper that I printed for my lecture in December last, and it shows no signs of degradation.

With regard to the subsequent operations of toning with gold or platinum fixing, etc., I have nothing to add to the remarks and directions given, either in my former paper or in my pamphlet on this subject.

Failures in Sensitizing.

The commonest failure that is likely to happen is to find that the paper, on exposure to light, refuses to darken in certain portions. This is caused by an insufficiency of silver. It is an absolute necessity, as I pointed out in my former papers, that there be some free silver in excess in order to get a vigorous image; if there be only sufficient to convert the chloride into silver chloride and leave no silver in excess, or if you wash the paper, so as to free it from all other substances, on exposure to light it will be found that this pure silver chloride will only darken very slowly, and assume at the best a faint lilac instead of a metallic brown shade. But if to this washed or pure silver chloride a little free silver nitrate be added, the darkening will be seen to take

place at once, and the mixture will blacken to the deepest shade. It is therefore necessary, in exciting paper, to brush on not only enough silver to convert all the chloride into silver chloride, but enough to leave a certain amount still in excess.

This appears to be the commonest source of failure in silver printing, and is much more common, as, indeed, is to be expected, when the paper has been soaked in the salting bath, and I have had many examples sent me. As a general rule, the paper prints out in patches of dark color, with insensitive places between, showing distinctly where the silver was in excess and where it was not. It is, therefore, important not to stint the silver, but brush plenty on ; indeed, the surface should glisten all over with solution, and when hung up to dry a few drops should run off at the bottom corner. As a rough guide, I find that about 2 drams of the silver bath are sufficient for a 12-inch by 10-inch piece of paper.

But in avoiding the Scylla of insufficient silver solution, I made the acquaintance of a Charybdis of too much silver ; and as it was some time before I thoroughly found out the cause of the phenomenon, I will give it here for the benefit of any future Ulysses.

During the past summer I made one batch of paper that, when printed, showed patches, or in some cases the whole surface covered with a curious frothy cobweb of white insoluble matter, something like the mold on damp leather. The image, too, was weak and sunk in, wanting in contrast.

My first thought was, of course, insufficiency of silver, and I added more and allowed the paper to lie flat and imbibe plenty of solution before hanging up to dry.

But this rather made matters worse, and I then ascribed it to the formation of carbonate of silver—an insensitive white salt—due to an excess of carbonate in the salting solution. But paper salted with the simple chloride also gave it, but in a less degree. I then came across an old piece of paper that had been soaked in the salting solution, and this printed out at once free from the defect.

This gave me the clew at once, for I saw that it was not want of silver, but rather excess of silver, that caused the appearance, and I tried coating a sheet unequally, leaving a pool to soak in the middle. As I surmised, the position of this pool was at once marked by the insensitive crape-like markings. I must confess that, chemically, I am still unable to account for the appearance; citrate of silver, which it naturally should be, is a soluble and sensitive salt, and I can only imagine it to be similar in composition to the white flaky scales that are generally gradually deposited when citric acid is added to silver. It may, of course, be due to impurities, and I should think a careful examination of it would interest some of our chemists.

Therefore, whilst using plenty of silver, do not use too much, and do not allow the paper to lie flat after coating; but directly the surface is seen to be equally covered with the solution, hang it up to dry by one corner, and allow the excess to drip off.

If the paper be properly and sufficiently salted, the above phenomenon is not, I think, likely to happen, for I clearly traced out in the above case that my paper had been, in the first case, salted on a weak bath, and in the second not floated sufficiently long.

I now come to the second half of my paper, that reserved for the intensification process, an outline of which I gave in my last lecture. I call it an intensification process advisedly, for it differs in its action considerably from several developing processes with which at first sight it may appear to have some similarity.

In all the developing processes, an image that is invisible, or nearly so, is developed out, but in this process the image is printed out, to almost any point short of complete density, and is then intensified up to the required point, exactly as one would treat a gelatine negative. Like a negative, also, the clear shadows, or what corresponds to them, the high lights, remain unchanged, no invisible image being brought to light, whilst the heavy deposit is still further increased ; and in both processes there is a tendency to harden the result, so that good results can be obtained from thinnish negatives. There is not the slightest need that any density be shown on the print, as the feeblest indications of light action can easily be intensified up to the most pitchy blackness, or it can be stopped short at any desired condition, and then toned and treated exactly as if it had been printed out in the frame in the ordinary way.

[*From Photography.*]

JENA GLASSES.

BY CHAPMAN JONES, F.I.C., F.C.S.

ABOUT two years ago we wrote concerning the productions of the celebrated factory at Jena, and commented upon the slowness of the makers of photographic objectives to ascertain for themselves the advantages or otherwise of the new optical glasses placed at their disposal. The ignorance of the matter at that time, even among those most intimately concerned, was so complete that the excessive color of the heavy flints made at Jena was stated to be a grave objection to their use; whereas they are now, and were then, remarkable for their freedom from color. When making our notes for the previous article, we were unable to discover any other English opticians than Messrs. Swift & Son and Messrs. Powell Lealand who patronized the Jena factory—Messrs. Swift & Son standing alone in this country in the application of Jena glasses to photographic objectives. Messrs. Zeiss and Messrs. Steinheil were also using the " new glasses," but we believe the first-named firm employed them for microscopic objectives only.

Before proceeding to give as accurate a description as we are able of the extent of the use of Jena glasses at present, to show that they have been gradually growing in favor during the last two years, we propose to indicate the chief improvements in photographic lenses that may be expected when the resources of the Jena factory are fully taken advantage of. But we would first insist that the fact of an objective being constructed of materials that give greater possibilities of perfection is no indication whatever of the superiority of the instrument. If the mathematical work is not sound, or the grinding of the lenses is faulty, the possible advantages may not be realized. We believe that it is a matter of fact that a certain objective issued by a continental firm as a specimen of the improvements they had effected by the utilization of Jena glasses, was far inferior to English lenses that have been upon the market for the last twenty years. It would not be just to condemn either the maker or the principles of construction that he has adopted by the examination of a single example of his workmanship, but it is evident that in photographic objectives, as in almost everything else, the best of materials may give the worst of results when the skill of the workman is inadequate.

In spite of many statements and insinuations to the contrary, the depth of definition of a photographic objective that has its aberrations fully corrected depends entirely upon its aperture and focal length, and is thus no indication whatever of the quality of the lens. It is true that curvature of field may confer an apparent increase of depth of definition with subjects of a certain form, but the same curvature diminishes the apparent depth in working upon subjects otherwise disposed. Depth of definition is estimated properly only when the effect of curvature of field is eliminated. In seeking for the improvements effected in lenses it is therefore useless to examine for depth of definition. If such a test is applied properly it is futile, for a measurement of the focal length and aperture gives all the information, and if carried out in such a manner as to unwittingly include other properties of the lens, the result is misleading.

The one matter in which we want improvement in our lenses is in their defining power toward the edges of the plate. Every practical photographer knows very well that he has to stop down his lenses to get " covering power." The need for this is a fault that will probably never be completely got rid of, but one that it is hoped will be very materially diminished in the near future. It is desirable that a photographic objective should give equally perfect definition over the whole of its field on a flat plate, so that the reduction of aperture should not be necessary for improving the image at the edges of the plate. The diaphragm then would have but one use, namely, to furnish proper control over the depth of definition. As it is, the operator cannot do as he would, because he has by his diaphragms to simultaneously realize these two

quite distinct necessities. The defective defining power away from the center of the field is due chiefly to astigmatism, and exists to very different extents in photographic lenses, but markedly even in the best. By reason of the combination of properties existing in some of the Jena glasses, it has been shown to be possible to still further diminish the astigmatism without introducing other evils, especially curvature of field. This is the one point in which improvement should be looked for in the new lenses that are now being made.

The chromatic correction of lenses can be more perfectly effected by means of certain of the newer glasses, but it is uncertain whether this will prove of any advantage in the construction of photographic objectives. The defining power that a good lens is capable of at the center of its field is more than sufficient for ordinary photographic requirements, and it is doubtful whether with our present sensitive surfaces it would be possible to take advantage of any improvement in this particular. However, Professor Abbe has been working in this direction, and has devised objectives which he calls "apochromatic" to distinguish them from those which are commonly known as achromatic. The lenses of newest form, and in which, presumably, the greatest effort has been put forth to make the most of the opportunity for improvement, have not yet been before the world long enough for a fair judgment to be formed of their merits. Different opinions have been expressed of the few new lenses from Hartnack, of Potsdam, and Zeiss, of Jena, that have been seen in this country, and the opinion of experts abroad is not entirely favorable. But a sound judgment of a principle cannot often be formed from a few early examples. In a year's time we shall probably know more of these instruments. The use of Jena glasses by English opticians has considerably extended during the last two years. Besides the firms that we have already alluded to, Messrs. J. H. Dallmeyer, Messrs. Ross & Co. and Mr. Wray are now using them, and they also claim to have secured considerable advantage thereby.

THE DISPLAY OF APPARATUS AT THE BUFFALO CONVENTION.

SECOND PAPER.

We were agreeably surprised in looking over the various exhibits at the fine display of the Cramer Dry Plate Works; Decker, Cleveland; Kuebler, Philadelphia; Jackson, Denver; Dana, New York; Stuber, Louisville; Rose, Providence; Endean, Cleveland; Curtis, Niagara Falls; Strauss, St. Louis; Arthur & Philbric, Detroit; Ranger & Cornell, Rochester; Havens, Jacksonville; Werner, Buffalo; Eppert, Terre Haute; Langill, New York; Samborsky, St. Louis; Bain, St. Louis; Brainerd, Rome; Armstrong, Milwaukee; Pach Bros., New York; Elton, Palmyra; Ely, Oshkosh; Miller, Columbus; McMichael, Buffalo; Pifer & Becker, Cleveland; Appleton, Dayton; Randall, Ann Arbor; Stein, Milwaukee; Rosch, St. Louis; Hemment, Brooklyn; Bolles, Brooklyn; Hetherington, Chicago; Courtney, Canton; McMichael, Detroit; Darling, New York; Root, Chicago; and in fact all the leading artists of this country being included.

The prints by John C. Hemment, of Brooklyn, which were awarded the prize, well illustrated the speed of their crown brand. The pictures were cabinet size, of horse races, hurdling, vaulting with a pole, foot-ball, and other athletic sports. A very fine picture in this collection was the running-catch of a foot-ball, the ball in mid-air and the catcher on a run, everything being perfectly sharp; another was a jumper caught in mid-air during a high jump, perfect in detail and sharpness.

The landscape exhibits were very fine, and among the most prominent was that of Jackson, of Denver, who captured the prize for the best landscapes on Cramer plates. The prominent feature was a view 8 feet long, printed on one

piece of albumen paper, which was so perfectly printed that no line or indication is given where the separate negatives are joined.

The portrait exhibit was certainly the finest ever shown at any convention, and the three prizes were awarded to Dana, New York; Rose, Providence; Stein, Milwaukee. The prize for showing the advantages of isochromatic over ordinary plates was awarded to G. M. Elton, of Palmyra, N. Y.

L. W. Seavey, of New York, occupied a large space and made a fine display, some of his new departures in vignetted backgrounds being especially effective. A large assortment of perforated screens in gold and silver effects and plastic backgrounds for use with Asiatic palms made themselves pleasingly prominent.

The Air Brush Manufacturing Company, of Rockford, Ill., exhibited a full line of retouching brushes and samples of work produced by them.

L. J. Uliman & Co., of New York, a large and attractive exhibition of frames, embracing several new and handsome designs.

The M. A. Seed Dry Plate Company were represented by Mr. A. J. Casseday, and made, as they always do, a very imposing show. They exhibited work from the studios of J. F. Ryder, J. S. Cummins, L. M. Baker, M. J. Steffins Max Platz, Gilbert & Bacon, F. Gutekunst, and others, which, together with the fine light and attractive way in which the exhibit was arranged, made their quarters very popular.

The Harvard Dry Plate Company were represented by Mr. Nash, of Cambridge, who showed work of excellent quality and great scope. Many well-known artists were represented here with credit to themselves and the plates they employed.

Otis C. White, of Worcester, made a good display of posing chairs and head screens, and many expressions of approval were elicited by his most ingenious application of the ball and socket joint to the numerous movements. The goods of this make rank at the head of the list in finish and accuracy of movement.

Fowler & Slater, of Cleveland, exhibited the King flash lamp, which is neat and practicable.

Benj. French & Co., of Boston, were represented by Mr. Wilfred A. French, whose genial smile is so well known throughout the profession. Their specialty was the anastigmatic lens, produced from the celebrated Jena glass made by Voigtlander & Son. The results shown were most interesting and speak well for the new departure.

Nothwithstanding the fact that The W. M. Collins Manufacturing Co.'s cards speak for themselves, they were on exhibition in greater variety and beauty than ever before. An important advantage that this company has over others in the manufacture of card stock, is, that they use no hypo in the process of manufacture which eliminates a very important factor of decay. Mr. F. E. Hastings, of the firm, and Mr. W. O. Wood, their genial representative on the road, were both in attendance.

Bausch & Lomb, of Rochester, showed a fine line of their elegant lenses and shutters. Comment on their work is useless; its reputation is world wide.

Sweet, Wallach & Co., of Chicago, represented by Mr. C. A. Sweet were on hand with a large line of burnishers and backgrounds which drew much attention, which was about equally divided between their own and the exhibit of the same line of goods by J. H. Smith, of Chicago, which was in the next adjoining space.

Ph. Bonte, of New York, was represented by Mr. C. H. Kirschner, but his exhibit of card mounts, which had been made up especially for the exhibition, was unfortunately delayed in the Custom-house and did not reach the grounds in time to be opened.

An extensive exhibit of burnishers and print trimmers was made by the Acme Burnisher Company, of Fulton, N. Y., prominent in which was their very serviceable 8-inch Acme Burnisher, which is said to be meeting with much favor.

The Peerless Burnisher Company were also represented with quite an exten-

sive display of their goods; and adjoining them was that of Jas. M. Dows, whose posing chairs were shown to good advantage.

Packard Bros., of Boston, occupied a conspicuous space and showed a very tastily arranged exhibit of backgrounds, accessories, etc., as did also J. W. Bryant, of La Porte, Ind., both of whose displays were close together and each of which attracted much notice and commendation.

The display of the Wuestner Eagle Dry Plate Company was very comprehensive and included specimens of straight and orthochromatic photography, the latter being made both with and without the use of the color screen. The original paintings were shown, together with negatives on ordinary and orthochromatic plates, and the difference between the two was wonderfully apparent, one, a brilliant piece of Japanese coloring, full of reds and yellows, being reproduced with an astonishing fidelity to values. Numerous other examples were shown, but this, the most difficult of all, was the most satisfactory in detail. A series of landscapes from nature demonstrated the fact that the orthochromatic plate possesses the same advantages for that class of work as for copying.

C. Hetherington, of Chicago, with his beautiful collection of combination accessories, backgrounds, etc., arranged a most artistic display, several of his new ideas in transparent lace effects being unique and beautiful in the extreme. Mr. Hetherington's long experience in operating has evidently given him advantages which he has been prompt to seize.

OUR ILLUSTRATION.

Flagship *Chicago*.

Our frontispiece shows a reproduction of the painting by Franklyn Bassford, prepared under instructions from Rear-Admiral J. R. Walker and the officers of his command, and published with the sanction of the Secretary of the Navy, Hon. B. F. Tracy. The picture illustrates the entire Squadron of Evolution of 1890—*Chicago*, *Boston*, *Atlanta* and *Yorktown*—the first fleet of modern vessels built for the United States. From the main truck of the *Chicago* flies Signal No. 1011 of the Secret Naval Code, meaning "Atlanta, fire at the target!" while from the same point on the latter vessel is shown the "Answering Pennant," indicating that the order is understood, while with topsail aback she pays quickly off to obey. These and all other *minutiæ* of accurate detail are most faithfully observed throughout the entire work, which, though perhaps meaningless to the average civilian, is nevertheless the real source of its great value both artistically and historically. The artist, L. Franklyn Bassford, was born in New York City in 1856. His grandfather was the late Abram Bassford, the inventor and manufacturer of the first "angle" cushion for billiard tables, and actual parent of the present game. Franklyn Bassford began his professional career in Brooklyn in 1881, when his first exhibited painting was purchased by the well-known connoisseur, A. A. Low, Esq., of that city. Since that time, with very few exceptions, all of his pictures have been executed "to order," and his patrons include the best-known flag officers of the New York, Atlantic, Seawanhaka and Eastern Yacht Clubs. Mr. Bassford has served a curriculum before the mast and on the quarter-deck, is a thorough practical sailor and navigator, which knowledge alone enables him to portray portraits of vessels with the accuracy which invariably distinguishes his work. On April 22d, of the present year, he received the official recognition of the Navy Department for the *Chicago* picture, and is the first American artist so honored.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION—ANNUAL OUTING.

This will take place at Fort Lee on the Hudson, September 17th or first fine day after. Boats leave foot of Canal street, or 125th street, North River. Circulars will be issued later.

ANTHONY'S

Photographic Bulletin.

EDITED BY

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Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,

and a corps of practical assistants.

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THIRD DAY.—(*Continued.*)

Mr. AMES—I might add something regarding the solutions of cyanide, but I do not suppose that there is anybody who uses them now. A man, however, was asking me to day how to precipitate from the cyanide solution. There are various ways of doing this. But unless you are practiced in it, I would advise you not to undertake it. The most thorough way to precipitate the silver from a cyanide solution is to neutralize the potassia by the action of sulphuric acid, but in this process you are throwing off cyanogen. Cyanogen is a deadly poison, and it doesn't do to inhale it. It must be done in the open air, and you must keep on the windward side of the vessel in which you are precipitating it, and you must have a vessel of a great deal more capacity proportionately, that is, of sufficient capacity to hold the solution that you are precipitating, as it will rise to a great distance in the neutralizing, and you can only neutralize it by adding a little at a time, and then letting it subside, and then adding again.

I sometimes find people using wet plates, and of course you have the developer from the wet plates. I found one man to day, who put his developer into the same cask that he was putting his print washings into and his hypo, and precipitated with sulphuret of potassia. That will never do. Keep your developer separate. After you have developed the wet plate, the silver that remains in it then is changed there to nitrate of silver, and the free solution that is upon the plate, as soon as you develop it, is precipitated in the metallic silver. Those washes can be run off into a jar. It is already precipitated; it needs nothing further to precipitate it. But if you throw it into the same receptacle that the other waste goes into, your sulphuret is precipitating your iron, and forms a sulphite of iron. Then you have a large amount of iron mixed with your silver, which increases the expense of having it weighed, and misleads you (because you have a large amount of precipitate) into the belief that you will have a large return. But you cannot return silver for iron. I haven't skill enough yet to change silver into iron, nor *vice versa*. It would be a miracle to do so, and I cannot work miracles.

As to the tests in precipitating. I would like to get you thoroughly systematic in the precipitation of your solutions. We have recommended you to use the sulphuret of potassia as a re-agent to throw down your silver. Now, some will say, "Will I put in some sulphuret of potassia?" It requires just double the amount of sulphuret of potassia or any other re-agent to precipitate two ounces of silver that it does one ounce. Now, to illustrate, suppose you have two ounces of silver in solution, and you put into that solution some sulphuret, use no given amount, but just simply a solution of sulphuret. We suppose that you have a sufficient amount to precipitate one ounce of that silver, and therefore you change one ounce of nitrate solution into a sulphide solution, and it falls to the bottom. As soon as that has fallen, the remaining solution is clear. You take it for granted that your silver is all down, and the sulphide you have formed is down. One ounce remains still of nitrate of solution. You decant that usually and throw it away. When the refiner comes along and takes your waste according to the amount of silver you have there, you are dissatisfied, while you are the one to blame, because you have thrown the silver down the gutter through ignorance.

In order to know when your silver is all down, after it has cleared up, take a little out in a clear glass, so that you can watch its behavior, drop in a few drops of the sulphuret of potassia and see how it behaves. If there is silver there, it will turn dark, and that sulphide of silver will gather into a curdled substance; that curdled substance will go trickling down to the bottom of the vessel. If you do not get such a result as that your silver is all down. Pay no attention to the color which may be formed by the dropping in of the sulphuret of potassia, if you do not form any precipitate or curdled matter that falls to the bottom. When you begin to get it white, and it is from the use of sulphuret of potassia, that is an indication that you are getting a surplus.

You want to stop when you get an excess of sulphuret, then continue to put in your silver waste, until you have changed it to the other side, but keep testing. One test for an excess would be, if you do not find it out by the milky trace, to drop in a drop of the solution of nitrate of silver. If you form a precipitate, that shows you have an excess of sulphuret.

Mr. Cramer—What would be the result if the sulphuret of potassia is in excess?

Mr. Ames—Nothing that is damaging at all, except the waste of potassia and the throwing off of sulphureted hydrogen, which has a bad smell. If this comes in contact with prints in your gallery it might do damage. There would be no other bad result.

If you use excess of salt in precipitating from the print washings, salt partially absorbs your silver and carries it back again and forms a solution of chloride of silver. You do not want to get an excess of salt, and I advise you to discard salt and put your washings and hypo all together and save it with the sulphuret of potassia. Many are very careful to save their washings and throw their hypo away, while there is more silver in the hypo than in the washings. You only wash out the free nitrate formed in your prints, and the silver will be in excess in your washings. So you are throwing away more silver by throwing away your hypo than by throwing away your washings and saving your hypo.

As to tests of nitrate of silver. Many people complain and say that the silver they get hold of is no good, that it is poor, and many believe it is adulterated. I do not believe there is any house in this country adulterating nitrate of silver, except it be caustic sticks. I have orders for caustic sticks from wholesale druggists, for number one and for number two. Number two is adulterated, and it is sold as adulterated, and so understood. It is adulterated sometimes as high as 60 per cent. with nitrate of potash, but no adulteration enters into the crystals. I do not believe there is a house in the country that manufactures adulterated crystallized silver. There may be a few manufacturers who are not responsible for what they are doing, who are sending their silver out through agents all over the country (and you don't know who makes it) that may have an adulterant in it, but I speak of reliable houses. If you wish to test nitrate of silver for impurities, I will give you a few tests for such as might possibly be carried into it. Metallic silver cannot be purchased finer than 999; 1 000 is virgin silver. I never purchased any finer than 999½, and it is a very rare thing to obtain that fineness in the City of New York. Therefore it carries but one-thousandth of impurity, which enters into the solution, but is not carried in the crystals. Our crystals are passed through a process which would get rid of any trace of it, if it were there. But there is a trace, as I say, and in manufacturing to the extent that some of us do—a thousand ounces of silver a day, and from that on to two thousand sometimes, of course with that amount of metallic silver, and the matter being concentrated constantly, when we have got several thousand ounces carried down in tailings in the solution, of course we have got concentrated impurities, and we often have to pass through with the refining process all that. Now, those impurities would be a trace of lead, a trace of copper, a trace of iron, and perhaps there might be a trace of tin, but if nitrate of silver is to be adulterated, nitrate of potassia would most probably be used. It might possibly be adulterated with nitrate of soda. To test for the nitrate of potassia, if you suspect it to be in your silver, take a small crystal of the silver and pulverize it with something perfectly clean. Do not let anything that will contaminate it come in contact with it. If you want to analyze, keep everything that you are analyzing with perfectly pure. Now, after you have pulverized this nitrate of silver, just make a small cup with a piece of filter-paper. Be sure that you have filter-paper, and roll it around it, and make a twist as hard as you can twist it, without breaking the paper. Touch a match to the end of it, and hold it in your fingers. Now, after you form a metallic wire in that way, blow the ashes off, and taste it in your mouth. If you have nitrate there, it forms a flux

which extends to the surface of the silver, and you will immediately taste it. If you should not be thorough in changing the nitrate to metallic, and it should only be partially reduced, you would get a strong caustic taste of the nitrate of silver, but you can distinguish between that and the nitrate of potassia. If you are thorough in the reduction of the metallic wire, you will not be deceived. To test for copper in silver, you simply have to use a test tube. Every photographer should keep clean test tubes. Take a small crystal of silver, and dissolve it in your test tube, and add aqua ammonia. If you have copper, it will immediately turn a blue color. If you have lead, it will form a precipitate of a dark color. If you have tin, it will form the same kind of precipitate, but will be of a lighter color. If you have iron, it will be of the color of oxide of iron, a rusty color, so that you can distinguish between the copper, the iron, and the tin, if any such thing is in your silver. All base metals, if they should be in your silver, can be extracted from it by thorough fusion, but nitrate of potassia you would not drive out by fusion. It is a salt that fuses, and does the same as your silver would fuse, and could never be got rid of by precipitation.

I don't know that I have anything further to add upon this subject, though there are a great many things I might mention in connection with it. I might talk about the emulsions, but you are not using emulsions, except as you use them on the dry plates, and even the photographer who is making batches of emulsion of his own has not enough of it to pay for talking about it here to-day.

Mr. CRAMER—I make some.

Mr. AMES—Yes, sir; you do; and you are thorough in precipitating it, and understand your business.

I can say this much, that there are different ways by which emulsion can be precipitated. I think Mr. Cramer's process is to boil it with concentrated lye.

Mr. CRAMER—Yes, sir.

Mr. AMES—Boil it in a barrel, with a main pipe running through the barrel, and bring it to the boiling point until the lye destroys the emulsion, and then it doesn't hold the bromide of silver, and it falls.

Another way is to use either sulphuric or hydrochloric acid, or even nitric acid; but that is more expensive than sulphuric or hydrochloric acid, and by boiling in this way it precipitates in the same way.

I thank you for your kind attention, and will now bring my remarks to a close. (Applause.)

On motion a vote of thanks was tendered to Mr. Ames for his very able address. The paper by Mr. G. Cramer, on account of the lateness of the hour, was read by *title* only. (See page 491.)

The paper by Mr. Decker on developing was presented and read by title. (See page 492.)

The *President*—Mr. Millburn comes the last this afternoon, and he suggests that I read his paper by title only. His explanation of this paper will be given to-night at the music hall by a practical demonstration of bromide enlarging, and I think you will all find it a very interesting and instructive lecture. He will just make a few remarks and then give way to others. We expect to demonstrate the workings of two or three flash-lights, and, during the evening, the negatives will be thrown upon a screen and give us the best knowledge of the value of the lamps for the illuminating power. There will be a flash-light picture made of the audience. A slide will be made from the negative and the image will be thrown on the screen before we leave the hall.

Mr. Percy King, in coming to the Convention, left behind his MSS. of the paper entitled "Can You Tell Me the Reasons Why?" so that that paper will have to be submitted to you through the journals.

Mr. Nash read the paper on "Retouching."

On motion a vote of thanks was tendered to Mr. Nash for his able and interesting paper.

Mr. Hurd requested that the reading of his paper be deferred until the closing session, owing to the small number of members present, which request was granted by the President.

The Convention then adjourned until 9 A.M., Friday, July 17th.

FOURTH DAY—FRIDAY MORNING, JULY 17TH.

The Convention was called to order by *President* HASTINGS, at 9.30 A.M.

The Secretary read the following communication:

"RICHMOND, Va., July 14, 1891.

G. M. CARLISLE, Esq.:

Dear Sir,—Please find enclosed check for $7 to pay my yearly dues, $2, and $5 for Daguerre monument. I suppose there will

be another collection for it. I am sorry not to be present with you. I hope you will have as good a time as you had at Washington.

Truly yours,

GEO. S. COOK.

The *President*—On account of some misunderstanding yesterday, connected with the nomination of the Secretary, the election was postponed until this morning. We will now proceed with this business.

The nominations will stand as named yesterday, Messrs. Overpeck, Heimberger and Gentile.

Mr. GENTILE—I wish to withdraw my name in favor of Mr. Heimberger. (Aplause.)

The President appointed Messrs. French, Decker and Conant a committee, to distribute, receive, and assort ballots for the office of Secretary.

A ballot having been taken, the following result was announced by the Secretary: Total number of votes, 82; necessary for a choice, 42. Mr. Overpeck, 6; Mr. Heimberger, 76. (Applause.)

On motion, the vote of the Association was made unanimous for Mr. Heimberger.

Mr. Heimberger briefly responded, thanking the Association for the honor of his election.

Mr. G. L. Hurd presented and read a poem in blank verse entitled "Shucks."

On motion, a vote of thanks was tendered to Mr. Hurd for his able and interesting paper.

Mr. LEWIS—Mr. President, in view of the fact that the Association will only meet every two years after this, and that there will be an interim of one year, which seems to me to be too long to wait, I would present the following resolutions:

Resolved, That we recognize in the Photographic Association of America the highest influences for raising the standard of photography in this country.

Resolved, That we recognize the Photographic Association of America as the chief of all organizations in this country which have for their aim the advancement of the art of photography and its various interests.

Resolved, That the Photographic Association of America shall use its influence in establishing and fostering State and territorial organizations throughout the States and territories of the United States, and that where no such organization now exists, the Photographic Association of America shall adopt such measures as shall result in effecting such organization.

Resolved, That where such organizations already exist, they should pledge their fidelity to the Photographic Association of America.

(Signed) FORD LEWIS,
President Photographers' Association of Ohio.

On motion of Mrs. Schooley the resolutions were unanimously adopted.

The President read a communication from the Buffalo Dry Plate and Argentic Paper Company, inviting the Association to a demonstration of the Hoovey Printing Machine, at the factory of the Company, Chester street, Buffalo.

On motion, the invitation was received with thanks.

The *President*—I have the pleasure of announcing that the Air Brush prize has been awarded to Mr. W. W. Sherman, of Milwaukee, Wis., for the best portrait in black and white; also one air brush to Mrs. H. D. Sanders, of Alfred Centre, N. Y., for the best portrait in colors. (Applause.)

Mr. DECKER—I understand that the funds of the Association will be rather low at the Chicago Convention, and therefore I think we had better not appropriate any large amounts for awards, but that should be left to the committee for the ensuing year. I therefore move that the Executive Committee be empowered, in its judgment, not to appropriate more than $1,000 for the purpose of making awards at the convention of 1893.

Motion seconded and carried.

The *President*—At the close of this Convention the Executive Committee will take it upon themselves to settle the matter of the Daguerre memorial. I am glad to announce that about $500 has been collected thus far towards the fund. (Applause.)

I have to announce that, unfortunately, the die made for the medals was broken, necessitating the making of another one, so that it will perhaps be two months before the medals are forwarded to those to whom they have been awarded by the judges. I have here the design of the medal, which was accepted by the Committee last January, and shall be very happy to have any one look at it who may desire.

The President then announced the prize awards. See BULLETIN, page 436.

The *President*—Before we adjourn, I want to thank all who have assisted me in trying to make this Convention a success, especially the members of the Executive Committee, who have done all they could in assisting me. The press have treated us in fine style. We have no fault to find with the reception we have re-

ceived here, and to you all who have been so lenient with myself while presiding here, I thank you, too.

On motion of Mr. Clark, a hearty vote of thanks was tendered the retiring officers for their energy and ability displayed in the management of the Convention.

On motion of Mr. Inglis, a vote of thanks was given the Executive Committee for their able work in behalf of the Association.

Mr. McMichael presented the following report of subscriptions received and promised since the last session in aid of the Daguerre Memorial Fund:

Mullett Bros	$10 00*
S. H. Morse	1 00
E. T. Billings	5 00
L. E. Stearns	1 00
W. H. Kibbe	1 00
Cash	1 00
Ph. Bonse	10 00
George Sperry	5 00
W. J. Lee	1 00
Simpkinson & Miller	10 00
W. H. H. Slater	1 00
Acme Burnisher Company	1 00
F. E. Hastings, A. M. Collins	10 00
Automatic Photo Rapid Print Co	10 00
New Eagle Dry Plate Works	25 00
Sweet, Wallach & Co	10 00
C. O. Endeanen	3 00
J. C. Hemment	1 00
J. Small	10 00
W. W. Black	1 00
E. D. King	1 00†
John P. Vail	2 00
G. S. Beardsley	1 00
C. W. Motes	10 00
T. G. Littlejohn	5 00
George Gardiner	1 00
J. G. Ramsay, Toronto	1 00
G. G. Gennert	1 00
A. A Stacy	1 00
L. M. Prince Bro	1 00
Peerless Burnisher	1 00
American Cerato Paper Company	25 00
George Murphy	10 00
Bradfisch & Hopkins	5 00
F. Pickerell	2 00
Mr. Lewis	3 00
George S. Cook	5 00
T. M. Logan	1 00
I. J. Kuntz	1 00
G. G. Shellburger	1 00
F. R. Barrows	1 00
C. H. Halbach	2 00
William Mearatt	1 00
J. W. Sires	1 00
F. S. Clark	$1 00
L. F. Hammer	1 00
Jacob Schwab	2 00†
R. O. Stokes	1 00
E. W. Moses	1 00
W. A. French	10 00
Fred. Lewis	2 00
G. H. Hastings	3 00
C. Gentile	10 00
J. M. Appleton	15 00¶
J. B. Schriever	2 00
M. M. Hatton	5 00
Hayne Photo Supply Company	10 00
I. M. Elton	1 00
W. G. Partridge	10 00
C. S. Cochran	2 00
C. Hetherington	25 00
J. W. Morrison	25 00
S. V. Pourtney	1 00
M. Donald	1 00
S. P. Means	1 00
J. Inglis	1 00
H. R. Koopman	2 00
Will Cundill	1 00
A. B. Post	1 00
M. L. Potash	1 00‡
H. L. Vandyke	1 00
E. E. Raessler	1 00
C. B. Marsh	1 00
L. W. Seavey	25 00
I. H. Fowler	2 00
G. H. Hastings	10 00
W. A. Davis	2 00
G. G. Rockwood	10 00
H. Lieber & Co.	25 00
E. Long	5 00
Mr. Howe	2 00
F. McCollen & Co	5 00
W. G. Entrekin	10 00
I. Domat	1 00
Fitzgibbon Clark	5 00

On motion, the Convention adjourned *sine die*.

The Springfield Camera Club is preparing for its regular exhibition of prints, which is to be held about the middle of November and which is expected to eclipse all previous efforts. It will be somewhat different from former exhibitions, for the work will represent the labor of many amateurs. It is expected that there will be an extensive exhibit by outsiders and out-of-town clubs. The usual diplomas, for the various classes, will be offered, while it is probable that this year, some award will be made to the out-of-town club making the best exhibit.

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* Will be sent. † Unpaid. ‡ From Photo. ¶ Collection.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—C. M. D. writes: I am about to procure a photographic outfit, but the selection of a lens is a puzzler. The Alvan G. Clark, it occurs to me, and if I understand it is about what I want. Does the catalogue mean that the $4\frac{1}{4}$ size is for a 5 x 8 plate? And does this work for portraiture on a $3\frac{1}{4}$ x $4\frac{1}{4}$ plate, and for groups on a 5 x 8, for landscapes on a $6\frac{1}{2}$ x $8\frac{1}{2}$? I had thought that a Darlot hemispherical lens was what I wanted, but the Clark lens seemed to have some advantages.

A.—The Clark lenses cover the plates you mention with special stops, thus: size $4\frac{1}{4}$ with stop *f*/7.5 will cover a plate $3\frac{1}{4}$ x $4\frac{1}{4}$, while the same lens with stop *f*/12 will cover a 5 x 8 plate, and with stop *f*/35 will cover a $6\frac{1}{2}$ x $8\frac{1}{2}$ plate. We have had no experience with these lenses and therefore cannot speak of them from practice. Our judgment would be for the use of a rapid rectilinear lens of moderate angle, such as the E. A. rapid lens of the cheaper kind, or a platyscope or an aristoscope of the medium priced ones.

Q.—Mrs. C. M. writes: I am very anxious to obtain directions for enlarging small pictures and transferring them to canvas, to then be painted in oil. I find quite a demand among my customers for this kind of work if I could only do it on the spot and not have to send it away to be enlarged.

A.—What you want to do is to enlarge your small negative on bromide paper and then mount the enlargement on a stretcher to be colored in oil. It must be distinctly understood that it needs an artist in oils to finish these pictures; no mere tyro can work on them and make them acceptable to persons of good taste. The directions for enlarging will be supplied by the publishers of the BULLETIN, who will also furnish you the materials if you write directly to them.

Q.—J. W. writes: When in New York I procured some albumen paper and when I arrived here I sent it to a photographer to be sensitized. The result you can see in the sample I send with this. Now, what is the trouble? Was the paper bad before it was sensitized?

A.—From a microscopical examination of the paper it appears that some pyro dust has fallen on the back of the paper, which, in sensitizing, has dissolved through and produced the dark spots that appear on the front surface.

Q.—E. G. A. writes: I have had some albumen paper that works very badly and gives brown spots like the samples sent, as soon as the prints are dry and go into the burnisher. I think it is the fault of the paper chemically, and others here think the same. I have always used this paper and never had this trouble happen before. Please help me out of this trouble.

A.—Your trouble is in the sensitizing bath, which has a fine scum of some material on its surface that is organic matter, and which reduces the silver on the surface of your prints. It appears to us that it must be a very thin film of oil from the water you use, judging from the character of the markings on the prints you send. Before sensitizing, draw the edge of a clean sheet of blotting-paper over the surface of your silver bath, and we believe the trouble will disappear.

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ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. SEPTEMBER 26, 1891. No. 18.

HALATION AND A NEW REMEDY AGAINST IT.

EVERY photographer who has tried to take a view of an interior, with sunlight coming in at the windows, has experienced the difficulty due to halation. This phenomenon is caused by the secondary reflection of the light that has passed through the film, and when it strikes the back surface of the plate. In the use of films this trouble is not experienced unless these are thick.

Quite a number of devices have been resorted to in order to overcome this disagreeable feature where the light is in sharp contrast to the shade. For the same trouble is encountered in landscape photography as well as in the taking of interiors. It is also apparent in the photography of luminous objects such as gaslights and lighted lamps. In the latter case it is almost impossible to eliminate the effect of halation completely.

The use of considerable silver iodide in the emulsion has the effect of diminishing or entirely eliminating the halation, but the plates fix slowly and the remedy is not always certain. Thickly coated plates do not show halation as much as thin ones ; but here we should be wasting silver, and this remedy is likewise not always effective. In photographing interiors we can cover the windows with some partially opaque material, or we can hang in front, and at some distance from the window, some black and opaque cloth to just cut out the window while exposing, removing the screen for a few seconds finally. But when we are taking a view of heavy foliage with a bright sky above and shining through the intervals we cannot take these precautions. In this case the backing of the plates with some opaque pigment, such as burnt sienna or lampblack mixed into a paste with some mucilage, has been recommended. The trouble with these remedies upon the back of the plate is the difficulty of getting them on evenly and in perfect optical contact with the glass at the back of the plate.

This last defect of the backing of the plate is the true difficulty to be overcome to counteract the effects of halation. For what we must do is to destroy

the reflecting surface of the back of the plate. If this is overcome the light will not come back under the film, and cannot act on the silver bromide upon its under surface. This is the scientific solution of the problem.

In a recent number of *Paris Photographe,* M. Cornu, of the French Institute, gives the results of a series of experiments made by him to determine the cause and produce a remedy for halation. Without going into details upon the manner of conducting the experiments we will give his conclusions. First: the elementary phenomenon, that causes the photographic halo, is an aureole formed around an isolated luminous point, and this is separated from the point by an interval of darkness; second—the aureole and the luminous haze are due to the superposition of the elementary halos; third—the diameter of the halo is proportional to the thickness of the glass plate that carries the sensitive layer; fourth—the halo is an optical phenomenon independent of the photographic impression; fifth—the halo is produced by the reflection of the light, diffused by the emulsion, from the second surface of the glass.

From these experiments he concludes that some means must be devised to eliminate the reflecting surface of the back of the plate. Starting with the optical axiom that reflection from the surface of separation of two media is always produced when these media have different indices of refraction, it is only necessary to apply to the back of the plate some liquid or varnish having the same index of refraction as the glass. But this alone is not sufficient, as there remains the reflection from the back surface of the varnish. To overcome this last reflection the varnish is mixed with lampblack. By experiment M. Cornu found that a mixture of six volumes of essence of cloves with one volume of essence of turpentine has the same index of refraction as glass. This last fact may be shown by placing in the mixture a clean piece of glass, which then becomes almost invisible.

The mixture of the essences of cloves and turpentine and lampblack is made into a paste and spread upon the back of the plates with a brush or wad of cotton. In this condition the plate is put into the holder and exposed. After exposure the black paste is wiped off the back of the plate and the development proceeded with as usual.

This procedure is not very agreeable, but the results obtained by M. Cornu, and reproduced in *Paris Photographe*, show that the halo is entirely eliminated. In the plate illustrating the article of M. Cornu we see a view of a lamp taken without the backing he recommends, and beside it a picture of the same lamp showing the effect of the backing. In the first case the light of the lamp has produced a strong halo; it is entirely absent in the second. Another example is a lamp with a globe, which, without the backing, gives a picture in which the globe is entirely invisible because of the halo; and in the second case, with the backing to the plate, the globe is perfectly clearly defined. Yet another example is a vase of flowers in front of a window with brilliant sunlight pouring through it. In this last case, without the backing to the plate, about half the flowers are buried in the halo; with the backing the picture is perfectly clear and the flowers well defined. A view of an open window shows the same good result with the use of the backing devised by M. Cornu.

This application of scientific principles to the elimination of the halo is a decided step in advance, and we hope that some of our readers will profit by the suggestion.

EDITORIAL NOTES.

Dr. Jones, of Vienna, has recently worked out, with the assistance of Professor Eder, a new orthochromatic collodion process which is said to somewhat resemble that of Dr. Albert, of Munich, only that it is more simple. He first dissolves for solution I—

Ammonium bromide	64 parts.
Distilled water	89 "

Which is slowly warmed.

He then adds :

Absolute alcohol	800 parts.
Thick collodion (4 per cent.)	2,500 "
Glacial acetic acid	55 "

Crystallized silver nitrate, 80 parts, is gradually dissolved in distilled water, 50 parts, and when wholly dissolved, a solution of ammonia (sp. gr. 0.9, added till the brown precipitate formed, is redissolved, when 800 parts of alcohol, at 45 degrees centigrade, are added.

The Burlington Camera and Sketch Club (Iowa) are in such a flourishing condition as to have outgrown their old rooms and to be in need of more commodious quarters—a sign of healthy growth.

The Brooklyn Academy of Photography, too, have lately moved into new quarters in Montague street, and preparations are in hand for lantern slide exhibitions, in which they do not mean to be beaten by the neighboring societies, if they can help it.

A method of rendering more visible faint and illegible manuscripts is described by M. Jaffé, who advises dusting them over with powdered talc and then dusting off with a soft brush. The talc adhering to the paper more than to the writing serves to accentuate the contrast of the two.

We note that Col. Sinn, of Brooklyn, so long and well known in other circles, has lately, through the subtle influence of his charming wife, Cora Tanner, become a convert to the study of photography, and as he never does anything half-heartedly, he has thrown a large amount of energy into his new pastime during his recent European trip.

It has been proposed by enthusiastic resident amateurs to form a camera club in Dixon, Ill., where heretofore all work of that nature has been individual and unorganized. Success attend the movement.

A charming trip has been arranged for Saturday, October 3d, and return on Sunday, by the combined efforts of the Society of Amateur Photographers of New York, the Newark Camera Club, the Brooklyn Academy of Photography, and the Hoboken Camera Club, who will go to New Milford, Pa., in special cars and make the most of the daylight, which it is to be hoped will be of a photographic quality.

A German paper states that the commercial nitrate of silver is often adulterated with from 50 to 200 per cent. of nitrate of potash, which is one reason for being content that we do not live in Germany.

We are in receipt from Messrs. Angerer & Goeschl, of Vienna, of a collection of their recent reproductions in half tone, from relief plates, which go to show that the art has not reached its zenith in this country at least. We have never had the privilege of examining work of this kind as fine, many of the subjects being as full of detail and delicate half tones as the finest gelatine prints. The grain is of extreme delicacy, and printed, as several subjects are, under a tint, produce the effect of heliotype or autoglyph work; several prints are produced from five and six different plates in colors, the registering of which is simply perfect. Messrs. Angerer & Goeschl are be congratulated upon having achieved results which are beyond compare.

The Newark Camera Club will hold a competitive exhibition of prints in October, which bids fair to be of much interest.

A professor in one of the French physiological stations has lately succeeded, by the combined aid of the chronophotograph and the zoetrope, in reproducing on a screen the motions of the lips in speaking, with such a degree of accuracy as to enable those who are familiar with the lip language to read with ease. This opens another useful field of applied photography in the teaching of deaf mutes.

Syrian asphalt, so long used in photography, is now being largely replaced by a manufactured article, produced by heating resin with sulphur to 250 degrees centigrade.

It is not often that a flash of lightning is caught in the act of taking human life, but the same flash which recently killed a man in Denver, Colo., was photographed by a Mr. Buckwalter, of that city, according to the evidence of all the attendant circumstances, as demonstrated afterwards.

The photochronograph is a recent invention of M. Marey, of France, which is so constructed as to photograph the flight of insects. The instrument is so delicate and complete as to make an exposure which is estimated at only the $\frac{1}{25000}$ of a second.

Many interesting experiments have lately been made in photographing with a black background and by means of double exposures, obtaining pictures of one's self playing games, carrying on an argument, etc., with one's own self. Bust pictures, etc., some of which are very startling, are also obtained in this way.

The work of the International Photographic Conference, in preparing their proposed chart of the heavens, progresses well, and when the work is completed, which may not be for five or six years, it is expected there will have been photographed in all more than 40,000,000 stars, ranging in size from those of the first to those of the fifteenth magnitude, and these will all be made on about

22,000 negatives, which will have been obtained by eighteen observatories, scattered all over the world. The thought is forced on our mind that, by the time this has been accomplished, either astronomical or photographic apparatus, or both, may have made such strides as to render its value less than it would seem at this time, and it may have to be done all over again. It will certainly be a stupendous achievement, however, from our present standpoint.

We received a call last week from Mr. C. T. Bush, of Dubuque, Ia., who left with us a beautiful and striking picture by Mr. W. V. Gill, an amateur of that city. The remarkable point about it is that it seems to have been made from the interior of some high rocky gorge, and the effect of the light is such as to brightly illumine a portion of the interior, leaving the middle again dark and showing a brilliant light again in the distant part of the cave. The detail is very fine, and the effect one seldom seen.

We were much interested a short time since in being conducted through the new quarters of our good friend, Geo. G. Rockwood, Ph.D. It is not often that one finds as here a store, reception rooms, skylight, or, as Mr. Rockwood calls it, "posing room," and dark rooms all on the street level, the whole occupying space 60 x 25, with extension 40 x 25. The lighting is very effective, and so constructed as to be available at any time of day and in all kinds of weather, strong, harsh effects being noticeable by their absence, and all softened down to a happy tone for the different kinds of work designed to be carried on. The show window and store are sumptuous, and the basement affords ample room for framing, bromide and copying work, storerooms, etc., all fitted with electric light. Dr. Rockwood is glad to have his fellow-craftsmen view his establishment and ask questions concerning the practical workings of his profession; and it will certainly be of value to many of his fellow-workmen to exchange ideas with him.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Color-Sensitive Photography.—Red Glass for it.—The Variation of the Color-Sensitiveness of Plates in Daylight and Sunlight.—Difference in the Development of Blue and Yellow in Color-Sensitive Plates.—The Quantity of Blue Rays in the Sky and in the Sun.—Instantaneous Panoramic Apparatus.—What is Graphol? The Action of Borax in the Developer.—Toning after fixing.

I read now in American journals more articles about color-sensitive photography (the so-called isochromatic or orthochromatic) than ever before, and as first inventor of the matter I am glad to see that the interest is increasing. But I find also in many of the articles, particularly those taken from European periodicals and books, a great many mistakes, showing that the authors of these articles are not fully conversant with the subject.

Thus I read: "A harmless light (for developing color-sensitive plates) is obtained by placing dark-orange and green-colored lights of glass over each other." I caution all against the use of this combination. Even the dark-orange glass admits the passage of green light. If a green light of glass is placed in front, the injurious green light is by no means shut off, but only the red rays, and those

are just the ones which are of the least action upon most of the color-sensitive plates. A purely red light remains therefore always the best. Unfortunately it is very difficult to obtain good red glass, most of it which is in the market admitting the passage of green light. This can be improved by placing two red glasses over each other.

Another curiosity are the new names for color-sensitive plates. They are called "isochromatic" (equal colored), "orthochromatic" (right colored), and "orthoskiagraphic" (right shaded) plates. But the plates are neither equal colored, nor right colored or right shaded, but color-sensitive, and that is the principal thing.

In return the ordinary plates are called "color blind," because they are sensitive only to *blue*. To be more exact yet, the eosin plates may be called yellow-green sensitive, the cyanin plates orange sensitive, because the maximum of their sensitiveness lies in the yellow-green of the spectrum as well as in orange, and the properties of the plates are clearly expressed by the name.

The investigations of the late Mr. Boissonas, as well as my own, have further demonstrated that the action of the colors upon color-sensitive plates by daylight is not always the same.

Scolik says (page 429 of this journal): "With a blue sky the diffused light is of less effect than when white clouds cover the same;" further: "It is advisable, when convenient, to take the objects in direct sunlight, because this is rich in yellow rays."

These facts have been confirmed practically over and over again, and even the appearance makes it evident that the cloudless sky is richer in blue, the sunlight richer in yellow rays. Oil paintings have for years been taken with preference in sunlight on account of the better action of the "warm" colors.

Herr Schumann, on the contrary, asserts now:

The erythrosin silver plate is equally sensitive to yellow and blue rays when the sun is in the zenith. Further, the erythrosin silver plate proves to be equally high sensitive with the yellow and blue of the spectrum picture of the clouds and the sky.

If his assertion were correct, it should be the same for the color effect, if colored objects be taken in the light of the blue sky or of the clouds, or in sunlight; according to Schumann, one has in the latter only the advantage of a short exposure.

Schumann's assertions are not only contradicted by photographic experience, but also by actual measurement of the quantity of the colored light. C. Vogel, the astronomer, has compared equally bright petroleum light, the dark and blue light of the sky and sunlight, and has found the blue in a dark sky eleven times, in a clear sky fifty times, and in the sun ten times as bright as in the petroleum light.

Croon (Analysis of the Diffused Light of the Sky—*Compte Rendus*, 109, 1889), with the aid of the spectrum photometer, for five different wave lengths, has further compared the intensity of the diffused refraction of the sky with the refraction of a Carcell lamp. The measurements took place at different times of the day, with the light of the sky from the zenith at Mont Ventoux and at Montpellier.

"The measurements show distinctly the supremacy of the blue rays in the light of the sky. This supremacy, according to Croon, declines from morning

to noon, and then increases again, but, however, without obtaining at the same hours after noon the same values as in the morning. These values differ from day to day." These differences should also be made manifest in the photographic action. The more blue contained in a light source, the more powerful the blue of its spectrum will act upon photographic plates. The same passes for the other colors, and if Schumann, nevertheless, puts them down in all cases as equal, he proves thereby only that his method of measurement is not correct.

Schumann exposed either with wedge-slot spectra or by taking different spectra at different times of exposure, beginning with a minimum of exposure. He compares then of different light sources (sun and sky) the time which is necessary in the development from the appearance of the beginning action in blue as well as in yellow, and finds in both cases equal time.

But he ignores the important fact observed by me in the early part of the year, that with silver eosin plates the yellow develops slower than the blue.

At first the latter appears more intensely; later on the yellow becomes visible, and only toward the end of the development it surpasses the blue—at favorable lighting with the white light of the sky—to finally become stronger than blue. The eosin silver plates require, therefore, full development. If anybody says he had to take such plates out of the developer to prevent fogging, they cannot show their sensitiveness for blue and yellow. A developer of not too rapid action should, therefore, always be taken, and with bromide of potassium.

Beginners in my laboratory make frequently the mistake of taking a rapid developer for color-sensitive plates, so that the picture appears suddenly, and they have to take the plates out of the developer for fear of fogging before the yellow has commenced to develop.

An old—almost forgotten—apparatus appears again in a new and improved form. This is the panoramic apparatus with revolving lens for panoramic views, whose visual field reaches to 160 degrees. This panoramic apparatus was constructed already by Martens in 1841, and as picture surface he used cylindrical daguerreotype plates.

When collodion photography with glass plates came into use the production of cylindrical plates was not possible. Flat plates were then tried (with success), which, so to speak, rolled off upon the cylinder surface. But lately, after the flexible skins had been introduced, recourse could be had again to the cylindrical film. This was done by Moëssard in Paris. Mr. Pinkernelle, marine photographer in Hamburg, has now constructed such a panoramic camera for films. The capability of his apparatus is shown by a view of Antwerp, kindly placed at our disposal, and which is particularly remarkable by the rapidity with which it was taken as demonstrated by the objects in motion.

Pinkernelle has indeed improved greatly on the original panoramic camera by converting it into an instantaneous camera. The lens, with the wings attached to same, is by means of a spring turned in the fraction of a second through the visual field. But the defects of the panoramic pictures are, of course, already visible in the pictures presented: 1—that horizontal or almost horizontal, long, straight lines appear; 2—that they have no determined focal point.

Another novelty is graphol. This is nothing but an old developer under a new name.

M. Mercier has confirmed the report that graphol, among other ingredients,

contains eikonogen, borax, sugar of milk and carbonate of lithium. Regarding the peculiar action of borax, acting in some cases as an acid, in others as an alkali, Mercier refers to two remarks of Aug. Lambert upon the action of borax on the higher alcohols and phenol, about which he reports in the *Compt. Rend.*, Vol. 108, No. 19, May, 1889. From Lambert's tests it was proved that mannite, glycerin, erythrit, dextrose, levulose and galactose give with borax an acid action, while the polyglucosides, including saccharose, lactose and quercitron do not show this reaction. He found further that pyrogallol, pyrocatechin and the higher phenols of the ortho series, similar to glycerin and mannit, show an acid reaction with borax, borate of sodium and a boron compound forming, which decomposes the carbonates, Orcin, resorcin and hydroquinone, which belong to the meta or para series, do not show this reaction. Mercier has found that eikonogen also does not give the reaction.

Mercier's tests with borax prove that caustic alkalies and their carbonates in the eikonogen developer can be replaced by borax, which has the advantage that a solid, durable salt can be had in a hot and moist tropical climate. Based upon this, Waterhouse has made further experiments. He says: In general, borax seems to act very good with eikonogen in connection with sulphite of soda. The solution loses its color very little. Several plates may be developed in it in succession, although the later ones require more time. The lights are clear and free from spots. The following bath has proved to be good, but it is somewhat to be modified with different kinds of plates :

Eikonogen	1 part.
Sulphite of soda	2 parts.
Borax	2 "
Water	100 "

For instantaneous views a strong developer would be required. Eikonogen with borax alone, without sulphite, in the same proportions as above, gives a powerful developer, but it discolors pretty soon and loses in strength.

Hydroquinone with borax alone does not give such a good developer ; the pictures obtained with it are weak and spotty ; by addition of sulphite of soda pictures are obtained of good density and full of detail, but the solution soon discolors.

To Mercier we are also indebted for a new toning bath, which is suitable for toning after fixing, but, as it seems, not for albumen paper.

It may be of advantage, particularly for amateurs and if no toning bath is at hand, to fix the pictures first and to tone them after a certain time.

Mercier takes—thus:

Ammonium sulphocyanide	30	grams.
Chloride of gold	0.30	gram.
Potassium hydrate	0.30	"

This bath can be applied immediately, the potassium hydrate causing at once the solution of the red precipitate, which by addition of ammonium sulphocyanide, forms with chloride of gold. The bath keeps well, shows a quick action, and permits the toning to blue-black. Tones of a more purple shade are obtained by replacing the potassium hydrate by 5 grams sodium hydrate. The solution takes place in from 2 to 3 parts of water. Albumen paper should not be taken, but paper sized with starch. The bath may also be used before

fixing, but the reaction is then very slow and gives a reddish tone. After toning the pictures have to be washed well.

The potassium hydrate bath is, of course, pernicious for albumen paper; but sodium carbonate—not hydrate—might perhaps be suitable.

BERLIN, September, 1891.

THE CHEMISTRY OF SILVER AND ITS SALTS, AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

SILVER (*Argentum*), AG.

SILVER is the whitest of the metals and possesses strong metallic properties. It is therefore one of the best-known reflectors of light and heat. Silver is ductile, very malleable and tenacious. It can be extended into thin foil and wires. A wire of 0.076 inch in diameter will hold a weight of 180 pounds.

It melts at 1,873 degrees Fahr., and expands considerably in cooling. At a temperature higher than its melting point it volatilizes. The loss from the volatilization is avoided in the industry by connecting the furnaces with chambers in which the vapors are condensed.

Silver is not oxidized at any temperature by dry or moist oxygen. In the air it blackens only on account of the presence of sulphureted gases.

It unites directly with sulphur, bromine, iodine, and slowly with chlorine. It is not attacked by the caustic alkalies, alkaline carbonates, chlorates, nitrates and silicates. However, when the latter are fused in presence of silver a certain quantity of oxide is formed which tinges the silicate yellow. This action is utilized in ceramic and glass tinting.

Silver is slightly soluble in sodium chloride, and the solution becomes alkaline from formation of sodium hydrate; thus:

$$Ag + NaCl + OH_2 = AgCl + NaOH + H.$$

It also dissolves in ferric sulphate.

Concentrated or dilute nitric acid attacks it readily:

$$3Ag + 4NO_3H = 3AgNO_3 + NO + 2OH_2.$$

Dilute sulphuric acid does not attack it, but boiling sulphuric acid converts it into sulphate with evolution of sulphur dioxide. Hydrochloric acid dissolves it with difficulty, evolving hydrogen. Chromic acid unites with it, forming on its surface a red coating of silver chromate, which is characteristic. The other metals do not present this peculiarity.

Silver unites with bismuth, tin, lead, copper, platinum, etc., but with great difficulty with iron. According to Thénard, silver can only mechanically retain it. It has, however, been united to steel in the proportion of $\frac{1}{500}$.

The alloys of silver and copper are analyzed by Gay-Lussac's process. This process consists in estimating the fineness of the alloy by dissolving a known weight of it in nitric acid and precipitating the silver by a standard solution of sodium chloride; thus, according to the following equation,

$$\begin{array}{l} NaCl + AgNO_3 = AgCl + NaNO_3 \\ 58.5 + \quad 170 \quad = 143.5 + \quad 85 \end{array}$$

it results that 58.5 grains of pure and dry sodium chloride exactly precipitate 170 grains of silver nitrate. Consequently, if this quantity of sodium chloride

is dissolved in distilled water so as to form a volume of 170 fluid drams, each dram of the solution will precipitate 1 grain of silver nitrate. A solution thus prepared constitutes a standard solution by which a very approximate assay can be made in the following manner: Dissolve 10 grains of the alloy in nitric acid and dilute with distilled water, then in a glass graduated in drams take 2 ounces of the standard solution and of it add, say, 6 drams, to the silver nitrate solution. Instantly this solution becomes milky with formation of silver chloride, but by stirring the liquid it becomes sufficiently clear to ascertain whether a precipitate is formed by adding a new quantity of the test. Proceed now by adding the chloride solution in very small quantity at a time until only a slight cloud (precipitate) is formed and read on the glass what quantity of the solution has been so far employed, say, 13 drams. Now take in a minim graduated pipette a known quantity of the standard solution and proceed as said above by adding it drop by drop until the last one produces no precipitate, and see how many minims, *less one*, have been used, say, 30 minims. Now, as $13\frac{1}{2}$ drams of the standard solution precipitate $13\frac{1}{2}$ grains of silver nitrate, and 1 grain of this salt contains 0.635294 grain of Ag, it follows that the 10 grains of the alloy analyzed contain 8.576415 grains of pure metallic silver.

The difficulty in analyzing with sodium chloride is to ascertain the exact moment the whole of the silver nitrate is precipitated. By adding a small quantity of ferric chloride to the acid solution of silver nitrate and precipitating the silver as sulphocyanate the difficulty disappears, for as soon as all the silver is thrown down the solution instantly assumes a slight red coloration. The standard solution is prepared by dissolving 76 grains of ammonium sulphocyanate in a quantity of distilled water so as to have a volume of 170 drams. Each dram of it precipitates 1 grain of silver nitrate.

The most simple and expeditious manner of precipitating silver nitrate to produce metal is to first acidify the solution with nitric acid, then introduce into it a plate of copper which gradually reduces the silver:

$$2AgNO_3 + Cu = Cu(NO_3)_2 + Ag_2.$$

The gray precipitate is then digested in dilute sulphuric acid, then washed by decantation until the water is no more tinged blue by aqueous ammonia.

Argentous Chloride—Silver Subchloride.

Argentous chloride is the brown precipitate formed when hydrochloric acid or sodium chloride is added to a solution of argentous oxide. It has never been obtained as a definite compound, its formula being Ag_2Cl, or, according to Von Bibra, Ag_4Cl_3.

Argentous chloride is reduced by light; heated to 500 degrees Fahr. it decomposes into argentic chloride and metal. Potassium cyanide and sodium thiosulphate (hyposulphite) separate metallic silver with formation of silver cyanide or thiosulphate:

$$Ag_2Cl + KCy = KCl + AgCy + Ag.$$

Treated with aqueous ammonia, sodium or ammonium chloride, silver and argentic chloride are extracted. This action is remarkable, as it tends to prove that the compound in question is a mixture of Ag and AgCl. Boiling hydrochloric acid acts in a similar manner.

Nitric acid does not sensibly alter it.

Aqua regia converts it into argentic chloride.

Acted on by a hot solution of mercuric chloride it whitens and calomel is formed. The compound formula is ($AgClHg_2Cl_2$).

Exposed to light under a coating of lead chloride it whitens.*

When a silver plate is immersed in a solution of ferric or cupric chloride it becomes covered with a brown coating of Ag_2Cl, which should be rapidly washed to avoid the formation of AgCl (Wetzlar). This brown coloration is not characteristic, for Ed. Becquerel, in his researches to photographically reproduce colored objects, obtained a violet chloride on a silver plate connected with the positive electrode of a battery by the electrolysis of hydrochloric acid ; and Niépce de St. Victor, in experimenting in the same direction, obtained on the silver plate placed in a solution of hydrochloric acid and cupric chloride a gray-black chloride which, submitted to the action of heat, assumed a sherry color. Thus prepared the compound was more sensitive to red light. Lately Mr. Carey Lea, by a series of remarkable experiments, succeeded in producing by various chemical actions, compounds colored black, purple, red, etc. "Of these substances, the red chloride shows a tendency to the reproduction of colors."†

The existence of an argentous chloride is not scientifically proven. It is considered by good authorities as a compound of silver with argentic chloride.

(*To be continued.*)

PARA-AMIDOPHENOL, ITS PREPARATION AND USE AS A DEVELOPER.

[Read before the Society of Amateur Photographers of New York.]

BY JAMES H. STEBBINS, JR.

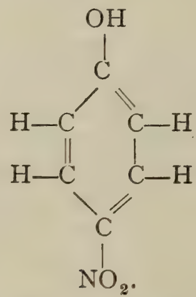
The attention of chemists and those interested in experimental photography has, since the introduction of the extremely rapid plates which are now to be obtained upon the market, been turned in the direction of producing new reducing agents, which are capable of bringing forth the latent image upon an exposed plate in the shortest and most perfect manner possible. It is only a short time since that the photographic community was startled by the introduction of a new reducing agent, called eikonogen, and which was said to be much more powerful than the time-honored pyrogallol ; since then, however, numerous other compounds have been proposed, among the latest of which may be mentioned para-amidophenol. Para-amidophenol is a compound of the benzol group and is a derivative of phenol.

When phenol is treated with cold dilute nitric acid, a tarry mass consisting of two mono nitro compounds is obtained. The compounds are known respectively by the positions they hold in the benzol ring, as ortho and para nitrophenols. On now submitting the tarry mixture to a steam distillation, orthonitrophenol distils over leaving the para compound behind in the retort, and

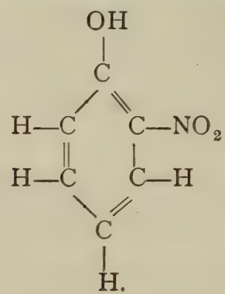
* Niépce de St. Victor. *Compt. Rend.*, vol. liv.

† Carey Lea "on red and purple chloride, bromide and iodide of silver; on heliography and the latent photographic image." Silliman's Journal (3), vols. xxxiii and xxxiv. Reprinted in Anthony's BULLETIN, 1888.—On the action of light on Ag^2Cl and on Heliography, see.—J. Herschel, *Atheneum*, 1839.—R. Hunt, "Experiments and Observations on Light which has permeated Colored Mediæ." Phil. Magazine, April, 1840.—Ed. Becquerel. *Ann. Chim. Phys.* (3),vols. xxii, xxv, xlii; *Bull. Soc., Franc. Photo.*, 1858.—Niépce de St. Victor. *Comp. Rend.*, 1851, 1852; his work "Recherches Photographiques." Gaudin. Paris, 1855. Also *Comp. Rend.*, vol. liv.—A. Poitevin. *Comp. Rend.*, vol. lxi.—St. Florent. *Bull. Soc. Franc. Photo.*, 1874.—Koziell. "Remarks on St. Florent's Process." *Brit. Journ. Photo.*, 1874.—Zantadeschi and Borlinetto. *Comp. Rend.*, vol. xxi.

which, upon cooling, crystallizes out from the aqueous solution in long grayish colored needles, which when purified are perfectly white. This substance melts at 114 degrees C. and has the formula:



The orthonitrophenol on the other hand crystallizes in yellow needles and melts at 45 degrees C. It is represented by the formula:



The reaction which takes place in the formation of the two isomeric nitrophenols is as follows:

$$C_6H_5OH + HNO_3 = C_6H_4 \begin{matrix} \diagup NO_2 \\ \diagdown OH \end{matrix} + 2H_2O.$$

It will thus be seen that one molecule of phenol unites with one molecule of nitric acid, forming a mixture of the two isomeric nitrophenols plus one molecule of water. In other words one atom of hydrogen of the phenol is replaced by the nitro group NO_2 of the nitric acid.

Of the two isomeric nitrophenols thus formed, the one that really interests us is the para-nitrophenol. On submitting this compound to a reduction with tin and hydrochloric acid or stannous chloride and hydrochloric acid nascent hydrogen is evolved, which, reacting upon the nitro group of the nitrophenol, converts the latter into amidophenol and water.

$$C_6H_4 \begin{matrix} \diagup OH \\ \diagdown NO_2 \end{matrix} + 3H_2 = C_6H_4 \begin{matrix} \diagup NH_2 \\ \diagdown OH \end{matrix} + 2H_2O.$$

But as in order to produce this result, it is necessary to use tin and hydrochloric acid, or stannous chloride and hydrochloric acid, we really get a tin double salt of para-amidophenol, which, when treated with sulphureted hydro-

gen, is decomposed, yielding the hydrochloride of para-amidophenol, stannic sulphide and free hydrochloric acid.

As the preparation of the paranitrophenol is quite troublesome, a simpler method for the production of the para-amidophenol would be by starting from the nitroso compound.

Nitroso compounds of the aromatic series are, like the nitro compounds, converted by nascent hydrogen into amido compounds, and as the preparation of the former is much easier than the preparation of the corresponding nitro compounds, it follows that the manufacture of the amido compounds must be simplified too. When nitrous acid is allowed to react upon phenol, equal molecules of each being taken, an atom of hydrogen in the benzol ring is replaced by the nitroso group NO with the formation of one molecule of water. Thus:

$$C_6H_5OH + HNO_2 = C_6H_4\begin{matrix} \diagup HO \\ \diagdown NO \end{matrix} + H_2O.$$

On now submitting the nitroso-phenol to the action of nascent hydrogen, the NO group is converted into NH_2 or amido group, with the formation of one molecule of water.

$$C_6H_5\begin{matrix} \diagup OH \\ \diagdown NO \end{matrix} + 2H_2 = C_6H_4\begin{matrix} \diagup OH \\ \diagdown NH_2 \end{matrix} + H_2O.$$

But, as in this case, the reduction is likewise accomplished with stannous chloride and hydrochloric acid, we likewise obtain a tin double salt of para-amidophenol, which, upon treatment with sulphureted hydrogen, yields para-amidophenol hydrochloride and free hydrochloric acid.

In practice upon a large scale, therefore, the above method would undoubtedly be selected on account of its simplicity.

Para-amidophenol is both of a basic and acid character and is capable of forming salts with acids but not with bases. If ammonia be added to the hydrochloride of para-amidophenol in sufficient quantity to neutralize the hydrochloric acid of the latter, the free base or para-amidophenol $C_6H_4\begin{matrix} \diagup OH \\ \diagdown NH_2 \end{matrix}$ is obtained. The free base crystallizes in leaflets, which melt at 184 degrees C., and are readily turned violet by the oxygen of the air. On adding hydrochloric acid to the latter we again get the hydrochloride $C_6H_4\begin{matrix} \diagup OH \\ \diagdown NH_2 \end{matrix}$ HCl, which dissolves in 1.4 parts of water and ten parts of alcohol. If instead of treating the free base with hydrochloric acid, we treat it with sulphuric acid, then the sulphate of para-amidophenol will be obtained.

It has been found experimentally that the hydrochloride of this substance exerts a very strong reducing action upon the haloid salts of silver, and for this

reason it has been proposed by Andresen and others as a developer. The formula which has been recommended is as follows :

Sulphite of soda (crystals)	50 grams.
Caustic soda	25 "
Para-amidophenol hydrochloride	5 "
Water	1000 c. c.

It is said that this compound is more powerful than eikonogen and does not fog the plates. It was my intention to have tested the para-amidophenol as a developer, but it took me so long to prepare the sample that I was unable to do so in time for this meeting. I will, however, be able to report upon this point at our next meeting.

THE BUFFALO CONVENTION AND ITS LESSONS.

BY CATHARINE WEED BARNES.

[Read before the Society of Amateur Photographers of New York.]

Having known something of amateur exhibitions and discussions, it has also been my privilege to study the professional side at the Washington and Buffalo conventions, and this paper is intended to be rather a series of impressions than a stenographic report of proceedings. Comparison, not only of methods of work, but of discussion, is exceedingly useful to both professional and amateur photographers, and hence the value of exhibitions and conventions such as the one at Buffalo and our own last May. By this I mean when they are rightly conducted and not made occasions for mere display or trying to suit every one. This last would, of course, be impossible, but they should be made occasions for deliberately, conscientiously and persistently seeking to raise the standard of photographic work. Every convention, every exhibition should leave a record on the photographic calendar worthy of consultation by the workers of the future, else what is its real value? It must either be an example or a warning. The difficulty always is to get a number of men with widely differing capabilities, mental and moral, to work for a given end without allowing self-interest, justifiable to a certain extent but not until it becomes absolute selfishness, to hinder perfect concord. And there is another point. In our day and generation it seems impossible to effect any kind of organization among followers of any special trade or profession without being brought face to face with some form of that nineteenth century hydra, the labor question. Like other social problems of the day, it is casting its shadow before, and yet I doubt if this thought would occur to any one except an amateur as being suggested by anything at the Buffalo meeting, although there were signs there which led me to think that very careful leadership will be needed to bring the Photographers' Association of America through the next two years. Being brought into quite close contact with "the powers that be" on that occasion I can testify that the Executive Committee was exceptionally well fitted for its duties, and that such were faithfully discharged. The arrangements as to prizes were carefully made and were more liberal than at any former convention. Competitors were to be known only by numbers, and the judges' names not published until after the awards were made. Each judge examined the pictures separately and then compared their markings. In spite of this effort at privacy, I was told the names of several competitors by another exhibitor, who was not supposed to know them any more than myself, and who urged me to name my own exhibit,

which I declined to do. At one session the subject of awards was so sharply handled that one set of judges resigned almost at the last moment, making it necessary to select others—a very difficult thing to do. A leading delegate told me that if he were judge in any contest where professionals and amateurs competed, he would find it hard to give a prize to one of the latter. He said it sincerely, and was not alone in his opinion, though others were just as decided as to ranking both classes on equal terms. Winning a prize, to a professional, is, of course, as good as a free advertisement, and he feels, naturally, that the amateur is in no need of that. It is rare that an exhibition is held where the awards are distributed to suit the general verdict, and people are apt to think there must be something very faulty in human judgment when its action seems so often governed by apparently remote causes. Disinterestedness might be supposed, one would think, to inhabit the sub-cellar, if there be one, in the well popularly believed to be tenanted by truth, as she so seldom is seen at the surface of the earth ; but the position of judge at any competition is, in my belief, not one to be desired. They are almost certainly blamed by some one, and in strict justice, they should be credited with an intention to decide fairly, subject to the ordinary fallibility of human nature. It is both useless and unwise to quarrel with fate on such occasions and merely proclaims the humiliating fact that you think more highly of your work than others do, and we all know that self-praise is no praise. The music caused by blowing one's own trumpet is seldom enjoyed by any one except the performer.

Failure is not an agreeable sensation, but there is always a reason for it, and one should be interested in tracing out the same, for there is much more to be learned from unfavorable criticism than uncritical praise. Can one be said, however, to fail who simply does not gain a certain prize? Is there not a deeper, truer success than merely gaining a medal or diploma, pleasant as that is? I have had reason to be thankful many times for failure when, in subsequent efforts, it led to much better work. The sting of failure is sometimes required to develop what might otherwise remain latent powers. In this connection might it not be well to suggest placing two shelves in one's laboratory for criticisms and commendations? We generally get both, unless hopelessly mediocre workers; and they should be kept in stock solutions, so that when we are unduly elated the criticism bottle might be used to advantage and consolation be gained after failure by recourse to the commendation solution. This, if kept in a saturated form, should be used very cautiously, as when too strong it is apt to have bad effects.

In considering the Buffalo Convention it is wise to remember that professionals and amateurs look at the photographic shield from two very different standpoints—money and love. Necessity is, too often, a heavy drag on artistic progress, but, as the world is constituted, so must it be. We must accept that fact, taking it into thoughtful consideration ; and the professional who claims the amateur is ruining his business says so often, realizing the faults in his own work and grudging under the pressure of daily labor the leisure for careful work enjoyed by most amateurs. Among several hundred delegates at Buffalo there were all grades of workers, and the student of physiognomy could readily discern those who were right or wrong in entering the profession. Men well known and honored in it were met on all sides with also earnest beginners and those who would never advance beyond tintypes. There were, besides, a few women who,

it should be stated, were treated with respect and genuine consideration. One, a delegate from Iowa, spoke several times, practically and sensibly, and one other read a paper which was kindly received. It would have been a dull brain which could not gain some ideas from the numerous private and public discussions, but it was disappointing to have so many papers read by title. Much of the effect of a paper so often depends on the delivery, and just as much care should be given to that as to its preparation. Indeed, I believe in doing even the smallest thing carefully as well as the greatest; it is a good habit to form.

A great mistake was made in having the sessions held so far from the center of the city, as much time was lost in going back and forth, and the members, as a whole, were very dilatory in coming together. It was almost necessary at some sessions to send out a town crier, if I may be allowed the expression, to collect an audience, and the constant passing in and out was annoying to speakers and hearers. The building was a large barn-like structure, with very slight partitions and a broad staircase, on a landing of which the meetings were held. The high ceiling and wide, open spaces on three sides rendered it still more difficult to speak or hear, and though behind the president's platform a sheet had been stretched to overcome currents of air, it was not of much use. There was almost constant noise in the stock department on the floor below, especially on the first and second days, when there was great confusion, for much of the arranging had been left until the last moment. It did not seem as if so much was made of this department as there should have been to fairly show the great improvements of late years, though most of the best-known dealers were represented. It was not possible to see the exhibits satisfactorily, they were spread over so much space, and to do it one had to neglect the regular sessions, which many did, I am sorry to say.

One specially notable feature of the convention was the free space given to the photographic press, and this is a custom worthy of permanence.

The art department was in a separate structure some distance from the main building and very well adapted to its purpose. There was plenty of room and a good light; but I must endorse the criticism in the Buffalo press to the effect that the exhibition should have been open to the general public during the whole time of the convention. They were only admitted for part of one day on payment of a fee which ought not to have been charged considering the distance visitors were obliged to go and the short time they might stay. Members had to show their badges to enter. After sending such a large and, in the main, a good collection, exhibitors were entitled to have their work seen by as many people as possible. The public should have been enabled to study the pictures thoroughly and not have the exhibition made a kind of close corporation affair—that is to say, if it was intended to be educational in its nature. The public needs education in these matters as much as, if not more than the photographers. I am continually surprised at the questions asked me about camera work, and people say: "I did not know there was much in it, that there was anything creative about it," and similar remarks. It interested me to note the various comments made by onlookers in the art building. One man said to a friend as they were looking at the grand prize picture: "Elaine! Oh, yes; by Shakespeare." Another said, "Why! There are only three figures in the death scene; there ought to be the whole court." I wanted to ask him if he had any idea of the difficulty of keeping so many people quiet for the requisite length of

exposure, and if he felt like incurring the expense and trouble of indefinitely wasting 11 x 14 plates. The grand prize pictures, by only four exhibitors, were in the second or main room and faced the entrance. In the first, or ante-room, were a number of bromide enlargements, some of Jackson's fine views and those of H. P. Robinson's. I showed a gentleman the latter's work and explained about combination printing, when he declared that such methods were not fair in photography, and seemed surprised at my not only justifying them but praising them. Some of the exhibitors had pictures framed together, with and without retouching, which were very instructive; and a new departure was made for American professionals in Mr. Stuber's platinum prints. Mr. Inglis, of Chicago, showed some bromide prints with sepia tone, and received a special prize; but, if I am not decidedly mistaken, that process has been worked by amateurs for some little time past. Mr. Stuber told me that he prepared his own platinum paper, which accounted for its brilliancy and exquisite tone. There was some very good bromide work, mainly in the line of enlargements, and the majority of the pictures were, of course, portraits. In these there were examples worthy of careful study, and I particularly noticed the large heads by Mr. Hall, of Buffalo; but it struck me forcibly that, as a whole, there was great evenness among them and little effort to get out of the beaten track. The exhibition, taken all together, did not compare with that held in New York last May, but the proceedings of the convention proper will reward careful perusal. It adjourned to meet at Chicago during the Columbian Exposition in 1893, but I cannot help feeling that it will be very much like trying to ride two horses at once. The vote was passed by the convention with a rush, but time will show if the step was a wise one.

PHOTOGRAPHIC CHEMISTRY.

By R. MELDOLA, F.R.S., *Cantor Lectures at Society of Arts.*

APART from the popularity of photography as an inexpensive amusement, enabling the amateur to obtain, with comparatively simple appliances, permanent records of places visited, or representations, more or less faithful, of the features of those whose individuality it is wished to bear in remembrance, the subject is becoming of daily increasing importance on account of the numerous applications which photographic processes have found, both in art and in science. For this reason it is desirable that the claims of photography, to be considered a distinct branch of applied science or technology, should be urged upon all those who are in any way interested in the advancement of technical education. Some progress has already been made in this direction in certain schools and colleges in this country, but when our efforts are compared with the keen appreciation of the subject which is borne witness to by the splendidly equipped photo-chemical laboratories of the technical high schools of Berlin and Vienna, it will be admitted that in this, as in other departments of chemical technology, we have allowed ourselves to sink into a secondary position. It is certainly remarkable that the land of Fox-Talbot and Herschel—the country which has given to the photographic world all the most important processes discovered since the foundation of the art by Nièpce and Daguerre*—should nowhere possess a school of photo-chemistry, where the subject can be taught from a scientific platform, or where original investi-

* This is no vain boast. Taking the discoveries in order, we have the silver print and chromatized gelatine emanating from Fox-Talbot, the cyanotype due to Sir John Herschel, the collodion process introduced by Scott Archer and Fry, collodion dry plates by Russell, printing with pigmented gelatine worked out by Swan, gelatino-bromide emulsion introduced by Maddox, and the platinotype process of Willis, to say nothing of the photo-mechanical printing processes, such as Woodburytype, to which English investigators have contributed so largely.

gators can find the requisite appliances and the skilled assistance necessary for the prosecution of research.

Setting out from the admission that photography must, sooner or later, become incorporated in all schemes of systematic instruction in applied science, I propose in the present course of lectures to show how this subject may be dealt with from a chemical point of view. From this it must not be inferred that photography is to be regarded purely as a branch of chemical technology, for it has also its physical side, and the highly trained photographer should be well grounded in the theory and construction of lenses, spectrum analysis, and, in short, in the general principles of optics. Assuming this knowledge to have been acquired, we may proceed to ask how the subject is to be taught, and the consideration of this question is of considerable importance—it is, in fact, of far greater importance than may appear at first sight, for photography is most admirably adapted to bring out into prominence the principles of technical instruction in a subject which is very largely of a chemical nature. The consideration of this question may help to dispel some of the haze with which the much-abused term "technical training" has been surrounded, and it will certainly lead to a clear conception of the object and scope of these lectures.

There are many who indentify technical instruction with the teaching of some handicraft, a notion which has, no doubt, arisen from the identification of technical skill with manual dexterity in some mechanical industry. By the adoption, either tacitly or openly, of this narrow definition, the chemical industries have suffered to a very large extent in this country, because their progress is more dependent on a knowledge of scientific principles, and much less dependent on manual dexterity, than any of the other subjects dealt with in schemes of technical instruction. Now, in order to give technical instruction in a subject like photography, which is so intimately connected with chemistry, we may adopt one of two courses. The student may become a practical photographer in the first place, and may then be led on to the science of his practice by an appeal to the purely chemical principles brought into operation. This may be called the analytical method. The other method is to give the student a training in general chemistry first, and then to specialize his knowledge in the direction of photography. This may be regarded as a synthetical method.

In other departments of technology, and especially in those where the underlying principles are of a mechanical nature, the analytical method may be, and has been, adopted with success. It is possible to lead an intelligent mechanic from his everyday occupations to a knowledge of the higher principles of mechanical science by making use of his experience of phenomena which are constantly coming under his notice. From this it is sometimes argued, by those who are in the habit of regarding technical instruction from its purely analytical side, that technical chemistry can be taught by the same method. Some teachers may possibly succeed in this process, but my own experience, both as a technologist and a teacher, has led me to the conclusion that, for chemical subjects, the analytical method is both too cumbersome and circuitous to be of any real practical use. No person engaged in chemical industry in any capacity—whether workman, foreman, manager or proprietor—can be taught the principles of chemical science out of his own industry, unless he has some considerable knowledge of general principles to start with. No person who is not grounded in such broad principles can properly appreciate the explanation of the phenomena with which his daily experience brings him into contact, and, if his previous training is insufficient to enable him to understand the nature of the changes which occur in the course of his operations, he cannot derive any advantage from technical instruction. These remarks will, I hope, serve to emphasize a distinction which exists between technical chemistry and other technical subjects, and I have thought it desirable to avail myself of the present opportunity of calling particular attention to this point, because it is one which is generally ignored in all discussions on technical education.

The reason for this difference in the mode of treatment of chemical subjects is

not difficult to find. The chemical technologist—the man who is engaged in the manufacture of useful products out of certain raw materials—is, so far as the purely scientific principles are concerned, already at a very advanced stage, although he may not realize this to be the case. The chemistry of manufacturing operations, even when these are of an apparently simple kind, is of a very high order of complexity. There are many branches of chemical industry in which the nature of the chemical changes undergone by the materials is very imperfectly understood; there is no branch of chemical industry of which the pure science can be said to be thoroughly known. For these reasons I believe that I am justified in stating that the chemical technologist is working at a high level, so far as the science of his subject is concerned, and this explains why he cannot be dealt with by the analytical method.

The general considerations which have been offered apply to the special subject of photography with full force. A person may become an adept as an operator without knowing anything of physics or chemistry; there are thousands of photographers all over the country who can manipulate a camera and develop and print pictures with admirable dexterity who are in this position. If we adopt the narrow definition of technical instruction, we should appoint such experts in our colleges, and through them impart the art of taking pictures to thousands of others. But would our position as a photographing nation be improved by this process? I venture to think not. We might be carrying out the ideas of certain technical educators by adopting this method, but I do not imagine that in the long run the subject itself would be much advanced; our position in the scale of industry would not be materially raised by the wholesale manufacture of skillful operators. And so with all other branches of applied chemistry; it is technologists, whose knowledge is based on a broad foundation, that are wanted for the improvement of our industries. These are the men that are raised in the technical high schools of the Continent, and whose training the continental industries have had the wisdom to avail themselves of.

To become a photographic technologist, as distinguished from a photographer, it is desirable, therefore, that the student should have received instruction in the general elementary principles of physics and inorganic and organic chemistry. When thus prepared, he may begin to specialize his studies, and the real technical training will be commenced. The application of chemistry to photography will naturally divide itself into two branches: the chemistry of the materials used in the art, and the theory of the chemical changes occurring in photographic processes. This last part of the subject I have already attempted to deal with, to some extent, elsewhere.* With respect to the chemistry of photographic materials, time will not admit of any attempt to draw up a complete code of instruction. Nor is this necessary on the present occasion, for the requirements will be met by the simple statement that this branch of the subject should be an extension of the ordinary chemical training, with special reference to the preparation, properties and reactions of the compounds which the student is most likely to have to deal with in photography.

In so far as the study of the chemistry of photographic materials is ordinary textbook knowledge, it is not proposed, therefore, to take up your time by unnecessary recapitulation; but certain special reactions, having a direct bearing on photographic processes, may be worth dwelling upon. Since the compounds of silver are by far the most important of photographic chemicals, it will be advisable to commence with these. After a study of the ordinary qualitative reactions of this metal, the student should be well practiced in the quantitative estimation, both gravimetrically and volumetrically, so that the value of commercial silver nitrate may be ascertained with precision. The reducing action of fused sodium carbonate, of zinc and acid, and of alkaline solutions of glucoses on the silver haloids, can be made the basis of practical exercises in the recovery of silver from residues. It is desirable also to point out, and to illustrate by experiment, that silver is displaced from the solution of its salts by the more electro-

* "The Chemistry of Photography." Macmillan. 1889.

positive elements—hydrogen, copper, mercury, iron, zinc, lead, and so forth. It is important also to demonstrate that silver is more electro-positive than gold and platinum, and displaces these metals from solutions of their salts.

In illustrating such points in the chemical history of silver as those referred to, and, in fact, in all practical work leading from ordinary chemistry to photographic chemistry, it will be found advantageous to adopt the general principle of performing the experiments, whenever practicable, both in glass vessels and on films. This method is admirably adapted to lead the student from the general science to its special application to his subject. For example, having shown that the salts of silver are reduced by such reducing agents as alkaline pyrogallol, ferrous sulphate, etc., in test-tubes, and having allowed the experimenter to convince himself that the precipitate in these cases is really metallic silver, the production of a film of the metal may be shown by taking a sheet of paper coated with silver nitrate, and, when dry, painting stripes of ferrous sulphate solution on the coated surface. On washing out the excess of nitrate from the unreduced portions, it will then be realized that the dark stripes consist of finely divided silver on a paper surface. With these silver films many instructive demonstrations can be given. Thus, the fact that silver displaces gold and platinum from solutions of the salts of these metals may be shown by passing the paper through a bath of platinic or auric chloride, when the silver stripe undergoes a change of color, indicating the replacement of that metal by gold or platinum. A comparison of the strip thus treated with a portion of the original strip—by treating both with nitric acid—clearly proves that the platinized stripe has lost its solubility in that acid. The application of this principle to toning and intensification will naturally follow when photographic processes are to be dealt with.

While demonstrating the reducibility of silver salts by such reägents as ferrous salts, etc., it must be strongly urged that reduction of the silver salt is accompanied by a corresponding oxidation of the reducing agent. This fact will be made apparent by the chemical equations; but it is important that the student should verify it experimentally. Many ways of doing this will suggest themselves, but it will be sufficient if I give one appropriate example. Every student may be assumed to be familiar with the different behavior of ferrous and ferric salts towards potassium ferrocyanide. Now, on adding a solution of ferrous sulphate to a solution of silver nitrate, we get a precipitate of silver, indicating the reduction of the silver salt. That a simultaneous oxidation of the ferrous salt takes place is proved by filtering off the silver and adding ferrocyanide to the solution, when Prussian blue is at once formed. An apology is really necessary for detaining you with such a well-known illustration, but the broad principle, that chemical reduction is accompanied by a simultaneous oxidation, is so important in photographic chemistry, that the student cannot be too strongly impressed with its generality.

The precipitation of finely divided silver may be made use of to illustrate some of the more obscure phenomena with which the photographic chemist is frequently confronted. It is desirable to point out that outside the domain of text-book science there is a mass of information concerning the properties of silver which may become of direct importance in connection with photographic processes, and the consideration of which will certainly help to broaden the student's notions of his subject. It may be well at this stage to broach the idea that photographic chemistry, like all other branches of applied chemistry, does not begin and end with a series of reactions which can be written down in the form of equations. This mode of treating the subject may be academic, but it is not technical. It is believed by many experimenters that silver is capable of existing in several different conditions of physical aggregation according to the manner in which it is precipitated from its solutions. Thus, the deposit obtained by adding ferrous sulphate to a solution of silver nitrate is gray; the product obtained by reducing silver solutions with organic ferrous salts is darker in color.* It is possible that the

* Pyrogallol will reduce silver nitrate in neutral or slightly acid solutions. It is not necessary to add alkali to show this reduction; the solution may be distinctly acid with acetic acid.

difference of color in these cases may be due, as suggested, to the difference of molecular aggregation. The rate of reduction may have something to do with it, and the well-known colored forms of precipitated gold, studied by Faraday, may be referred to in this connection.

But, on the other hand, there is another possibility which must be borne in mind and well emphasized in dealing with photographic chemistry. I allude to the tendency which silver and its compounds possess, in common with many other metals, of bringing down and retaining traces of foreign substances, in whose presence the metal or its compounds may be precipitated. This kind of combination is not sufficiently recognized by orthodox chemistry, because it does not take place in definite proportions, but there are many branches of applied chemistry where this so-called molecular combination plays a very important part. The practical outcome of these considerations is that the student of photographic chemistry cannot be too early prepared for the occurrence of indefinite combination, and he must not be allowed to suppose that, because a distinct formula cannot be ascribed to such compounds, they are outside the pale of chemical science. I have thought it necessary to utter this caution, because in the present state of knowledge we must not commit ourselves to dogmatic assertions about allotropic modifications of silver. It may be that the different colors of reduced silver are due to the retention of "traces" of some foreign substance. The fact that minute traces of impurity produce remarkably great changes in the physical properties of metals is now familiar through the experiments of Roberts-Austen, and we must be prepared for a similar modification in such a physical property as that of color by the influence of associated "impurity."

In connection with this part of the subject the recent experiments of Carey Lea* demand some notice. By reducing certain organic salts of silver, viz., the citrate and tartrate, with the corresponding ferrous salts, the experimenter professes to have obtained three allotropic modifications of silver. After carefully considering the conditions of formation, and after repeating some of the experiments, I must say that there appears to me to be no sufficient evidence that these colored forms consist of the pure metal. On the contrary, all the evidence goes to show that some impurity is present;† the published analyses of the products in no case show a greater percentage than 98-75 per cent. of metal. If an alloy of gold, containing only 0.2 per cent. of lead, differs so completely from pure gold as to be brittle instead of malleable and ductile; if the colors of many metals can be completely modified by being alloyed with small quantities of other metals, such, *e. g.*, as the deep purple alloy of aluminium of gold, it is not unreasonable to suppose that the color and other properties of precipitated silver would be modified by combination with 1 per cent. or more of some impurity which may consist of an organic iron salt. At any rate, it seems premature to speak of these products as allotropic forms of silver.

The whole subject of the reduction of silver salts by various inorganic and organic reducing agents is well worthy of engaging the attention of the photographic chemist. Did time permit, I could point out many lines of investigation which might be followed up with comparative simplicity. If the student can be brought to realize that we have yet a great deal to learn about the nature and composition of these colored products—if the spirit of inquiry can be stirred within him till he is prompted to take up the investigation of some of these compounds for himself—he is far more likely to contribute towards the advancement of photography than by taking any number of pictures. And I will add that, if he has the true spirit of technology in his composition, he will derive quite as much pleasure from this kind of work as from manipulating the camera.

(*To be continued.*)

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* *Amer. Jour. Sci.* (3), vol. xxxvii, p. 476, and vol. xxxviii, pp. 47 and 129. Also *Phil. Mag.*, vol. xxxi, pp. 238, 320 and 497.

† Thus in repeating these experiments Prange (*Rec. Tran. Chim.*, ix, 121) found that the dark substance precipitated from the solution of the so-called "soluble silver" always contained traces of iron as an impurity.

[*From British Journal of Photography.*]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

CHAPTER XIII.—UNSUCCESSFUL NEGATIVES AND THEIR TREATMENT.

IT is almost unnecessary to say that in the ordinary course of business a retoucher will have to prove his skill by working upon every possible quality of negatives. He will inevitably get them of every class—good, bad and indifferent, and with all these he will have to establish his reputation for being a skillful retoucher by securing the best possible results in each case. In connection with commercial photography I fear his task will be strewn with many difficulties, and the majority of the negatives entrusted to his care may truly, and in some cases flatteringly, be termed indifferent. From this I wish it to be understood that this class may be said to possess several degrees of quality, or the want of it. It will be well, therefore, to thoroughly consider how we may have to treat this varied class of negatives, ranging from the absolutely bad to the merely indifferent. The two negatives I have already treated (with my pen) were really good, in fact first-class, but nevertheless requiring a great deal of knowledge and skill to retouch properly. I wish it to be thoroughly well understood that in the present instance I do not select these unsuccessful negatives with any intention of making a sly dig at the operator who produced them, or in the least to hint at his inability. Quite the contrary, some of the defects are purely accidental, no doubt the result of the general hurry and pressure of business; others may be, and in many cases are, traceable altogether to inattention upon the part of his assistant. Still, this is not the point. The object we have before us is to know how to treat them successfully when they are placed in our hands, as they surely will be if we go in thoroughly for retouching.

In the present system of dry plates the loss of a panel plate is a very serious item, and one which the photographer must very naturally spare no pains in trying to avoid. A first-class panel plate, such as our best plate makers produce, costs, roughly, from two shillings to half-a-crown, and many such being spoiled must greatly affect the temper as well as the income of the photographer; hence every effort must be made to lessen, if not altogether to avoid, the necessity of taking duplicate negatives, or the still more vexatious alternative, a resitting.

Now the studies that I have selected are two panel negatives—the one a lady in evening dress, full-length, and three-quarter face; the second an officer, three-quarter figure, and full-face. In these two may be found most of the troubles to be generally found in the class of negative under our consideration. We will begin with the lady's negative. It is not necessary to enter into the various causes for the many defects, but I can truly say the operator need not be held responsible for them. Of course, it may be said, a great number of them would not be there if he had seen them in time; but again, had he the time, or was he bustled along in business, so that he had not time to calmly examine the various points of his picture? I think this is very likely, for I know many cases where this system of bustling and commercial photography exists. I think too, in this case, the sitter was an exceedingly difficult subject, and as though this were not enough, the quality of the light was anything but what it should be under the circumstances. Under these conditions we could scarcely look forward to a first-class negative. The light being bad at the time, the operator should have given a rather long exposure to the plate, but, the sitter being an uneasy subject, he could not do so, hence what we term an under-exposed negative, wanting in detail as well as brilliancy. Here we must aid the unsuccessful efforts of the operator to gain a successful result.

When printed, a general gray tone will pervade the whole picture resulting from such a negative, not one brilliant light anywhere to be seen, and as a natural result—that most objectionable of faults—flatness will be the leading feature. Add to this the fact that the sitter had either altered the position of her head (unobserved by the

operator—*bien entendu*) just before exposure, or else the assistant may have badly fixed the head-rest, leaving a portion of it in view. By some mishap, too, a portion of her dress has taken such a form just over the shoulder as to impart a very objectionable appearance to the figure. The waist, too, is very thick and unshapely, and the dress generally is flat and wanting in force and detail. The eyes are rather hollow, and the markings in the face are all strong, although not suggesting an unpleasant expression. The nose is very weak, and its outline scarcely defined. There are also creases in the bust which should not be left in their present condition. The ornaments on the neck and dress are likewise devoid of brilliancy or effect. There are a few stains, too, in the background, etc. In fact, it is a most unfortunate negative, but presumably the best that could be got at the time, and had consequently to be passed, and hence the retoucher in due course finds a most uninviting undertaking before him.

Our task now is to clear away these defects and see what we can do to make a good picture, or, more correctly, a passable one. As in the case of a good negative, we must rub our medium upon all the parts upon which we feel we will have to work with our pencil; we can then start our labors at the forehead, working a high light where we feel it should be. In fixing all these high lights care must be taken to secure their all being in their proper places and of correct relative strength. The deep shadows around and under the eyes will require considerable reducing, All this, however, cannot be successfully accomplished by retouching them in the ordinary way. We will find it necessary, after retouching them, to place a little color on the opposite side of the glass in order to stop out the light somewhat. This is very easily done by putting a little color—I generally use black—on the glass (not the film side), and then dabbing it with the finger until it is dry; by this means the natural softness of the negative will be preserved and the desired end gained. To give the nose its due value and importance in this instance will require extreme care and judgment. The light must be very carefully drawn in—it must not be a straight or well-defined line running all down the bridge, but must be so placed as to impart absolute shape. This light must then be softened towards the shadow or outline, which in this case is very indistinct. In order to give a little force to this outline we must, when working the shadow side of the face, endeavor to suggest a line or shadow that will not only help to indicate the shape of the nose, but also give it strength and prominence.

The shadows falling from the wings of the nose and those from the corners of the mouth may be treated as before laid down. The treatment of the chin, neck, etc., may be the same, having due regard to the greater necessities of a bad or indifferent negative in comparison with a good one. But now, in all cases like the present one, when all this is done, the face will be found still to lack brightness and prominence. To impart these qualities, the reverse side of the negative must be matt varnished, and then with a stump charged with plumbago proceed to strengthen the face by laying it on such parts as may most require to be brightened. Done with care, this treatment will prove of incalculable value to the picture. Indeed, we may consider that the treatment of a head under the conditions stated may be carried out in the usual way—it being of course so modified as to meet the necessary requirements of the negative—with the addition of the matt varnishing and stumping.

In such cases as the one under treatment, when the dresses are light, they require a great deal of care and work to help them out. Now here we have a portion of the dress showing over the back of the shoulder, which almost gives the idea of a malformation, and must be cut away. For this purpose a really sharp knife will be necessary, as it is a matter of cutting, not scraping, that will be necessary to carry out this operation. With a sharp knife, therefore, you will proceed to cut away the film representing the offensive portion of the dress, and little by little reduce it to the same degree of opacity as the surrounding background. If by chance you should reduce it too much (a very likely matter), that is to say, if you reduce it to such an extent that the part cut away will print blacker or darker than the rest of the background,

you will then have to apply some medium to the part abraded, and you can then, by using your pencil in the ordinary way, work it up to the same degree of density as the background. For this purpose a very blunt pencil will be the best, as softness is essential, the least approach to hardness of lines being inconsistent with the natural quality of the background. It is quite possible to make these alterations with such precision that no trace of the retoucher's work will be perceptible on the print afterwards. I need not say that this is a result which is most essential. Should a number of copies be ordered from such a negative, and these alterations be badly executed, it would leave a dreadful amount of work for the spotter, and indeed, would not at all pay the photographer.

The waist must be treated in a similar manner. First draw in lightly with your pencil what you think would represent a good figure, then proceed to abrade the film as before. Of course, where the dress is black, and consequently darker than the background, there will be no necessity for the use of the knife, it being possible to carry out the alterations with the pencil alone. I have known alterations such as I describe, judiciously done, so please a customer that an expensive life-size painting has been the result. All offensive creases or shadows on the bust must be removed, as such markings tend considerably to mar the beauty of the figure. In panel pictures all this is of great importance, and every little detail is worthy of a retoucher's best attention.

The ornaments round the neck and on the dress will want attention. For this get a pencil a grade or two softer than that ordinarily used for the face, and with a decided and sharp touch impart the necessary high lights. Having done this we come to the rest of the dress, which being at present flat and of one tone, will require a lot of helping up as regards the lights. All the broad masses of light should be put in with a stump. This done, the absolutely high lights can be put in with the soft pencil used before. By this combination we secure softness and brilliancy, the two qualities before wanting in the negative under our consideration. I do not wish to convey the idea, however, that the negative treated as I direct will ever yield a really first-rate print, but it will so materially help it that a very passable picture will result from a negative completely useless. I think I may leave the subject now, and hope that the reader, should he meet such a negative, will know how to tackle it. The head-rest when showing, and all other unfortunate or offensive markings in the background, must be similarly treated.

Now for the portrait of the soldier. I do not think it very necessary to enter into the minutest details as regards the face; my instructions are, retouch it as you would the example I gave you in a former chapter, the only difference coming with the matt varnish, which we put on the opposite side to the film, and proceed to stump out those parts which should be in relief. Of course the cutting away of the matt varnish would strengthen a shadow. Owing to being packed in the regulation trunk or box an officer's coat and trousers are sometimes very badly seamed and creased. When photographed these creases appear something dreadful, and must be taken away. This is not such an easy matter as one might think at first sight, but with care it is quite possible to remove them without leaving any trace of our work. This is absolutely essential in an officer's uniform, as any trace of the work would make the tunic look old and shabby. If there should be a depression in the chest it must be removed. In the negative before me there are a lot of short creases as though the tunic had been damp when packed away in the case, and of course, they must be removed. This may mean a great amount of work, but it must be done, or else a resitting will be the result, for he would be ashamed of appearing in his uniform when it was in such a condition. There are also some very unsightly markings in the sleeve; they must be removed, and a sharp bit spoiling the shape of the arm must be cut away. The trousers, too, will require looking over in the same manner.

In the ordinary cabinet portraits all this labor would have been spared, but when

it comes to panel-size pictures really first-rate results are required. Under these circumstances no pains must be spared upon our part to make the negatives perfect, or as nearly so as we can. I think I have mentioned almost everything which will require the retoucher's help in ordinary portraiture, and will, therefore, be able to turn my attention to other branches.

I hope the student will have been able to grasp the intentions of the last few chapters, and that I have not quite failed to thoroughly place before him the studies I had before me as I wrote. Later on the pictures in connection with these chapters may be published, and if so they would be of inestimable help to the beginner. It is so difficult to explain such subjects without the aid of diagrams that much will depend upon the careful manner the reader has perused these chapters.

I can now unhesitatingly enter upon the various methods of retouching, or means by which we carry out the instructions I have tried, I hope successfully, to convey. I believe in knowing what you should do before you attempt to do it, hence I have left the "methods" to the end.

[*From Journal of the Photographic Society of India.**]

FURTHER NOTES ON ELECTRO-CHEMICAL REVERSALS WITH THIO-CARBAMIDES.

By COLONEL J. WATERHOUSE, B.S.C., *Assistant Surveyor-General of India.*

As a postcript to my paper on this subject in last month's *Journal*, it was stated that an experiment with a pair of silver plates coated with precipitated silver bromide, of which one had been exposed to light and the other not, when connected with a very sensitive galvanometer and immersed in a plain eikonogen-lithia developer showed a distinct electrical current, the needle deflecting toward the left, but when a pair of similar plates were immersed in the same way in some of the same developer containing 5 drops per ounce of Professor Reynolds's compound salt of thio-carbamide and ammonium bromide, the current was reversed and the needle deflected to the right. It was found that with the ordinary developer the exposed plate formed the negative pole of the galvanic couple and produces a negative photographic image, while, with the thio-carbamide developer, it becomes the positive pole and produces a positive photographic image. This reversal of the current has since been successfully repeated with the same kind of plates and developer and also with a developer containing thio-sinomine.

Silver plates bromized by immersion in bromine water have also shown the reversal of current clearly, and I have apparently been able to obtain it on ordinary gelatine dry plates, though in this case the currents are exceedingly weak. There is, therefore, practically little doubt of the fact of the reversal taking place.

With silver plates, it was found that the observations were rendered rather uncertain by reason of the comparatively strong currents caused by polarization, especially after the plates had been used a few times, being cleaned merely by a good rubbing with emery powder and polishing, and therefore more or less impure on the surface. They can, however, be rendered pure by heating to a red heat and quenching in dilute sulphuric acid. It is desirable to do this always before using the plates.

Experiment having shown that it was possible to obtain evidence with the galvanometer of electrical action between the exposed and unexposed halves of a gelatine dry plate during development with ferrous oxalate, various methods of rendering gelatine dry plates sufficiently conductive to show the currents formed during development were then tried. Among the substances used were:—(1) Gilt plumbago, which did not answer very well. (2) Silver bronze powder, which is generally a very good conductor, but did not answer at all in this case; the current from a battery would not pass. (3) Reduced silver in very fine powder, as deposited from mirror silvering

* From corrected proofs of author.

solutions. This is an admirable conductor for ordinary electrotyping purposes, and also answered well in this case when applied wet, and polished after drying so as to give a bright and fairly solid coating. (4) Silver leaf. This answered well, but not quite so well as gold leaf.

The gold leaf seems perhaps the best material to use, because the gold conducts the current without exercising any chemical action with the developer, which might of itself cause currents. It is not so readily attacked by the sulphur set free at the negative pole as silver is, though some action probably does take place.

Either gold or silver leaf can quite easily be applied to the plates. The following method is effective.

Take a piece of stout blotting paper rather larger than the sheet of gold leaf; moisten it slightly, so as to leave it evenly moist without being wet, and lay it down carefully over the gold leaf, smoothing it lightly into contact all over. Then lift up the paper, to which the gold leaf will attach itself. The sheet can then be cut into convenient sizes and the pieces applied to the gelatine surface of the dry plates. A piece of hard dry paper is laid over the blotting paper and well rubbed down with the finger. The blotting paper will then be found to come away quite easily, leaving the gold leaf attached to the plate.

Another method, which answers very well, is to coat the glass slips with a thin substratum of gelatine and chrome alum; when dry the gold leaf is applied as above. Strips of sensitive gelatine film, which in the case of Wratten's "ordinary" plates, may easily be stripped from the original glasses, can then be transferred to wet blotting paper and laid down over the gold leaf, much in the same way as the gold leaf itself. This method has the advantage that the gold leaf is not in contact with the developer, and the currents seem to pass quite as easily as when it is outside the gelatine films.

The dry plates used were Wratten's "ordinary," in slips about 4 inches long and 1¼ inches wide, the same as the silver plates.

The gelatine offers a considerable resistance to the electrical current. A current from a bichromate cell, which, when passed through a pair of bromized silver plates in eikonogen developer will mark a deflection of between 80 and 90 degrees with the tangent galvanometer; when passed through a pair of gelatine dry plates faced with gold leaf and immersed in the same developer will mark only 40 to 50 degrees. Consequently, the currents produced by the action of developers with or without thio-carbamides on exposed and unexposed dry plates are exceedingly weak, and only just perceptible with the very sensitive suspension galvanometer. With silver plates coated with silver bromide, the currents are very much stronger, but, as stated above, the results are somewhat uncertain owing to polarization currents. In all cases the currents produced with the thio-carbamide developers are stronger than those produced with the plain developer.

It is not yet quite clear how this reversal of current is produced, but some observations by W. Skey, recorded in Volume XXIII of the *Chemical News*, throw a good deal of light on the matter. He found that metallic sulphides which have the power of conducting are also capable of generating electricity; and from a list he gives of the relative polarity of different sulphides, it appears that silver sulphide is positive to silver. In a battery consisting of a sulphide and a metal in acidulated water, the gas liberated is sulphureted hydrogen, the nascent hydrogen exerting a desulphurizing action upon the metallic sulphide, the ultimate effect of which is in some cases to completely reduce the mineral to the metallic state.

This seems to bear out the observation recorded in my first paper of the reducing effect of the thio-carbamides in alkaline solution on silver haloids.

Skey also shows that sulphides are capable of performing the function of the negative element of a galvanic couple.

We have seen that the galvanometer shows that with the ordinary developer the exposed parts of a sensitive surface of silver bromide form the negative pole of a gal-

vanic couple, and, consequently, by the laws of electrolysis they attract the deposit of reduced silver, the alkaline metal and the hydrogen, whilst the liberated bromine or other acid radical elements and the hydroxyl go to the unexposed parts forming the positive pole.

On the other hand, with the thio-carbamide developers, silver sulphide is formed by the action of the developer on the unexposed parts of the picture, which then become the negative pole instead of the positive, and attract the sulphur, the hydrogen, the alkaline metal, and some of the deposited silver formed by the action of the developer on the exposed parts of the plate, which now become the positive pole and attract the bromine and the hydroxyl, etc., the former combining with some of the remaining deposited silver to form silver bromide, which is dissolved out by the fixing solution, leaving more or less residue of reduced silver.

There can be little doubt, I think, that this is, roughly stated, probably the correct explanation of the reversals, though much remains to be done in working it out fully, in order to throw more light on the various reactions which take place. A further investigation might result in finding some method of making the photographic reversals more perfect, and it seems likely that an electrolytic examination of various developing agents would afford valuable information on the general theory of development. The currents produced are, however, so weak that their satisfactory observation would be a matter of some difficulty. The subject is one of which I have very little knowledge, but it is to be hoped that the investigation may be taken up by some one more competent to deal with it.

[*From Photography.*]

WOODBURYTYPE FOR AMATEURS.

BY W. T. WILKINSON.

SOME time ago the following process was worked out but never published because other process methods proved a little more troublesome, and this method was forgotten until the letter from Mr. Macdonna, the other week, awakened the slumbering recollection, and here is the process in full, but unless the operator starts fair, and fits, himself up with the proper apparatus, the results will not be good; don't try the process in an off-hand manner, and then, when failure come, write and abuse the process.

The apparatus needed is—A drying box, in which to dry the sensitive tissue, three sheets of patent plate glass 12 x 10, an upright grooved tin box to hold three plates 15 x 12, fitted with a Bunsen burner underneath to warm the water in the grooved box, three or four leveling stands, a thermometer, three zinc plates 15 x 12, polished and leveled.

The materials consist of gelatine, Nelson's No. 2 photographic, bichromate of ammonia, a box of India-rubber solution, benzole, methylated spirits of wine, and plain collodion.

The drying-box is merely a shell fitted with six zinc trays, each tray about two inches deep by 12⅛ in. x 10⅛ in. inside, with a small ledge at each corner to rest the plate upon, so that the plate will serve as a lid to the tray, the back of plate being flush with the top of tray.

These trays are half filled with chloride of calcium, and are placed in the box one on the top of the other.

(*To be Continued.*)

OUR ILLUSTRATION.

THE handsome photogelatine print forming the frontispiece of this issue of the BULLETIN is from a fine negative made by Mr. A. A. Knox, of New York, and he tells us it was developed with the Anthony Hydroquinone Developer. It is certainly remarkably full of detail, and forms an uncommonly pretty picture from an artistic point of view.

ANTHONY'S

Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,

Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.

and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE opening meeting for the 1891–92 session was held on Tuesday evening, September 1st, in the rooms of the American Institute, 113 West 38th street.

The meeting was called to order at 8.15 o'clock by Mr. C. Van Brunt and the reports of committees taken. The Secretary announced the receipt of various photographic publications and circulars, among the latter being the list of artistic photographs for sale by Muller & Co., of Berlin, these being offered to members of the section at a considerable reduction.

Mr. O. G. Mason, on behalf of the Outing Committee, said it had at first been decided that the annual excursion should be up the Hudson, with dinner at Newburgh. But consultation with members had shown the early hour necessary for starting would not suit the majority, and the distance would prevent their joining the party later in the day. It was then decided to go to Fort Lee. The boat from Canal street or the Ferry from 125th street reach Fort Lee and render the place easy of access. The probable date is September 17th. Should the day be unsuitable the first pleasant day after the 17th will be taken. Circulars will be sent out giving particulars.

This ending the regular business, the Chairman said the meeting was open for discussion. The Secretary said that two gentlemen had promised to be present but had failed to materialize. Mr. Becker had brought along a few slides and by means of the lime light they were shown on the screen. It was announced that the new electric lantern made especially for the section under the guidance of Dr. Laudy was ready and in the room, but it was thought best to let Dr. Laudy have the honor of using it for the first time before the section. Mr. Becker's slides included several views in Hoboken, among others being a scene during the blizzard, showing the effect of the wind and snow on the huge telegraph poles. Several views in the Catskills were very good, some of them being on plates by the albumen process, and made by Mr. Becker himself.

At the close of the lantern exhibition, Mr. Van Brunt called attention to a paper recently published in the *Photographic Times* by Mr. P. C. Duchochois. The paper treated of the reduction of photographic negatives and positives, and the method given consisted in immersing the plates in dilute aqua-regia, well washing and drying, and then exposing them to the sun. The result claimed was considerable reduction of the density without loss of the delicate detail. Mr. Van Brunt had tried this method, but no matter how strong or how dilute the solution used was, the film would leave the plate. He did not think it possible to continue the reducing operation long enough for perceptible reduction without the stripping off of the film.

MEMBER—Nitric acid was used years ago in transferring the collodion film from glass to other surfaces. Mr. Duchochois is an eminently practical man, and it is a great pity he is not here to-night.

F. J. HARRISON—The principle of the action would seem to be the solution of the silver image in nitric acid and the simultaneous formation of silver chloride. The sunning produced much less opaque shadows.

The paper, having been hunted for, was read by the Chairman.

Mr. O. G. MASON regretted that the journal did not state the proportions used and further details, and deprecated the publishing of any paper where all possible information was not given.

A. V. BENOIT—Nitrate of uranium will obviate the tendency to strip. The same substance, uranium nitrate, he used in his work. If paper be written on with uranium nitrate, and this laid face down on dampened gelatine, the points where the ink touches the gelatine become insoluble. By inking with a printer's roller, a copy of the letter may be obtained, and a careful worker may pull off as many as three hundred copies.

For the next meeting a good programme was promised. The section adjourned at 9.45.

COLUMBUS CAMERA CLUB.

THE Columbus Camera Club held its first meeting, following the summer vacation, September 3d, at which time a great many prints and negatives were exhibited by the members, showing that they had not been idle. The summer was productive of more outings than any previous season. The last, and most extended one in the club's history, was enjoyed the latter part of August. It occupied nearly a week, and was to what has been very appropriately called "Ohio's Wonderland," located in Highland County, O.

For this outing the club owe an everlasting debt of gratitude to Mr. C. H. Collins, a prominent citizen of that county, who traveled over, planned and scheduled the entire trip through this rugged, romantic and picturesque section of Ohio.

Here were found mountains of modest proportions, caves numerous and varied, magnificent chasms and cascades and rapids whose sparkling waters dance in the sunlight. Upon the mountain roads ox-teams and their barefooted driver and his shaggy dog were met. The camera raids on these subjects must have been a torture to them, but it was no use to try and escape, so they quietly submitted, wondering why they were so attractive.

Along the streams occasionally an old mill with an over-shot wheel, the source of power, came into view, and they were, at all times, the target for many a camera shot. Many other surprises were found at every turn. Here nature (unaided by the hand of man?) had had full sway in shaping her own architecture.

The pictures of this outing, together with the incidents and experiences related by the members, were extremely interesting.

The communications which had accumulated during the summer were read by the Secretary and proper action taken on each by the club; following which a short paper was read by one of the members on club work, in which were suggestions for inaugurating a systematic line of work for the winter. The paper was productive of an interesting discussion, followed by all the members volunteering to prepare papers on topics of interest to the amateur.

Some matters pertaining to the club's new quarters were talked over. They expect to be surrounded with conveniences and accommodations second to no other club in the United States when in their new quarters, which will be fitted up especially for the club in a new building now in the process of construction for the Y. M. C. A. of our city. Here the wandering members of other clubs will find the latch-string out.

Altogether the meeting was very interesting and enjoyable, the members departing at a late hour with a wish for many more of a similar nature.

J. N. BRADFORD.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THIS Society held its first meeting for this session on Tuesday, September 8th, at its quarters at 113 West 38th street. President Stebbins occupied the chair and called for order at 8.20.

The first item in the programme was a paper by the President on "Para-amidophenol; its Preparation and Use as a Developer." This paper appears in full in another portion of the BULLETIN. A sample of para-amidophenol, prepared by Mr. Stebbins, was passed around for inspection. In reply to a query, Mr. Stebbins stated that at 0 degrees Centigrade 1 part of para-amidophenol was soluble in $1\frac{1}{4}$ parts of water or in 10 parts of alcohol.

Miss Catharine Weed Barnes then read a paper on "The Buffalo Convention and its Lessons." This paper appears in this issue of the BULLETIN.

The Secretary announced that an outing had been arranged for October 3d and 4th. The society will be joined by members of the Newark Camera Club, of the Brooklyn Academy of Photography and of the Hoboken Club, and the trip will be to New Milford, Penn. The arrangements are in the hands of a competent committee and everything will be arranged to insure the comfort and pleasure of all those who go.

Attention was also called to the part to be taken by the society in the coming American Institute Fair. Exhibits will be divided into

five classes, three bronze medals to be awarded to each class.

Mr. Markley exhibited a portable dark tent for use while on a trip. This was considered very complete by members present, every possible requisite being provided for. Mr. Markley also exhibited a device for attachment to the back of the camera, this doing away with the putting of the head under the focusing cloth, besides showing the image not inverted. A mirror is attached to the base of the ground glass frame and the back covered with a dark cloth, at the top of which is an aperture through which the image in the mirror can be seen. A hand camera, of the same design as the Facile, was also shown by the same gentleman.

The meeting adjourned at 10 o'clock.

OBITUARY.

CARL SUCK.

AGAIN we are called upon to chronicle the death of an old veteran photographer. Mr. Carl Suck, of Berlin, died on the 2d of September, after a lingering sickness, in the fifty-eighth year of his age.

The deceased was not only one of the foremost professional photographers of the Empire City of Germany, but also a zealous promoter of the arts, and highly esteemed by his numerous friends and colleagues.

May he rest in peace.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—W. W. S. writes: I do not fully understand photometer directions, and would be pleased to have you explain them thoroughly. What is meant by numbers failing to appear, and why does lens have to be stopped down? When more than one figure appears in square opening like (4, 5), (0, 4) and (125), how many seconds does it mean? Have tried photometer, and can see all the figures from one end of the scale to the other. They are new to me, and would like to have you explain their use, so that I may be able to understand same.

A.—As you do not tell us the kind of photometer you use we are at a loss to understand your question. There are several kinds in the market, and if you will name the make of the one you refer to we will try to assist you.

Q.—W. E. L. writes: Can you give me some information as to how pictures are made on porcelain? Have had inquiries for them, but never saw any. Suppose they are printed on some sort of transferable material.

A.—The directions for the production of photographic pictures on porcelain are long and full of details, and we think it is better to send such work to those who make a specialty of it. All that we can do here is to refer you to several French books that treat of the subject—we know of none in the English language. The books are: "Traité Pratique des Emaux Photographique," Traité Pratique de Platinotypie sur Email," "Heliographie Vitrifiable"—all by the same author, Geymet, and published by Gauthier-Villars et fils, Quai des Augustins, Paris. The Photoceramic Company, of New York, do such work; if you wish to consult them write to F. B. Forster, 1440 Broadway, New York City.

Q.—J. C. C. writes: I notice that you give O'Neill's toning formula in the last issue of BULLETIN. Will you kindly give me the amount (or near) in ounces, drams or grains, of bicarbonate and acetate of soda, or whether the amounts given in tablespoon and teaspoonfuls are level or heaping full? If you can give me actual scale weights I will be under many obligations to you. Hoping to hear from you soon.

A.—A large tablespoonful of sodium bicarbonate weighs 1 ounce of 437.5 grains (about), and one teaspoonful of sodium acetate weighs half an ounce (about). It is intended that the proportions shall not be exact, but about these quantities.

Q.—F. S. O. writes: On page 432 of the "International Annual," in speaking of sodium sulphite solutions you say that in solutions of 184 grains to the ounce the solution will register 24 degrees Beaumé. I have been unable to verify it. I took 3 ounces of distilled water and put into it 3 ounces Troy of sodium sulphite crystals, and when entirely dissolved the solution registered only 18 degrees Beaumé. I tried it twice with the same result. Will you kindly let me know wherein I have made an error in the test? I tried the

experiment with sodium carbonate, and in a solution of 120 grains to the ounce of water I got 11 degrees Beaumé.

A.—If you will look at the table again you will find that it reads at the top of the column you refer to: "Grains *in* one fluid ounce," and not "Grains *to* one fluid ounce." You have made the mistake by adding the salts *to* the water when they should be *dissolved in* the water. Put the salt in your measure and then add the water to the proper volume and you will find that the tables are correct.

Q.—A. B. G. writes: I send herewith a print on Pizzighelli paper and treated to acid as per directions, but I cannot clear the yellow out of the high lights. Can you tell me through the BULLETIN what is the matter or is this the way the finished print should appear?

A.—The trouble with the sample of paper which you send is that it has been kept in a damp place. You may succeed in making the whites cleaner by using a little stronger acid for the washing and by adding a little citric acid to the bath at the same time.

Q.—G. F. H. S. writes: For the last six years I have been using ready-sensitized albumen paper. I have carried out the instruction very carefully, still I have quite a number of different shades of tone. Now and then I can strike a nice dark brown, but very often the prints turn either black or red on me and I have no way of controlling this. I have tried leaving them in the citrate bath for a longer or shorter time without success. Can you not tell me where the difficulty is? A few prints, which are about three years old, are getting yellow spots on them; what is the cause of this?

A.—We cannot tell the cause of your trouble without seeing some of the prints. It is probable that you have failed to fume the paper long enough; this is the most common mistake. Fume for half an hour in a good tight box and with strong ammonia. Send us some prints.

Views Caught with the Drop Shutter.

COLONEL THEO. C. MARCEAU, the well-known photographer of Cincinnati, Indianapolis and San Francisco, was recently married to Mrs. Fiske, of Fresno, Cal. The wedding was a most brilliant affair, the *elite* of the military circles of San Francisco and neighboring cities being present to do honor to the handsome Colonel and his charming wife. We wish the happy couple all the joys that life can give and many years to compass them.

WE have received the *menu* of the dinner tendered to Mr. C. S. Abbott, of Chicago, by his friends, Messrs. Hetherington, Place, Steffens, Coover, Strauss, Harrison and Pattison. It was given "just to show there was no ill feeling," and judging from the viands consumed it must have been a thoroughly enjoyable affair. We hope the good feeling that the event celebrated will hold fast, and that before long we shall have to record the fact that almost every photographer in Chicago was present at the second dinner given under the same motto.

FRANCIS HENDRICKS, of Syracuse, N. Y., and now Collector of the port of New York, was a photographic merchant for a quarter of a century. We congratulate the Administration upon the selection of business men for business places.

Mr. JAMES LANDY, the well-known photographer of Cincinnati, recently sent a set of his beautiful pictures, illustrating the "Seven Ages of Man," to the Shakespeare Memoria at Stratford-on-Avon, in England. The following letter tells how they are appreciated on the other side of the water:

SHAKESPEARE MEMORIAL,
STRATFORD-ON AVON,
JUNE 10, 1891.

DEAR SIR:

I beg leave to acknowledge, and very heartily thank you for, your photographic contribution to our Memorial Art Collection, in the name of the Society, and in that of Dr. Nason, by whom your friend Mr. S. T. Griffiths, has been kindly introduced to me.

As an old photographer and artist who at one time and for many years contributed regularly to the English photographic journals and occasionally to the American, permit me to congratulate you upon the great technical and artistic triumph you have achieved in these pictures which will here have thousands of admirers from all parts of the world.

I am, dear sir,
Yours very truly,
A. H. WALL.

J. LANDY, Esq.

THE JACKSON PHOTOGRAPH AND PUBLISHING CO., of Denver, Col., have issued a very complete catalogue of the magnificent views taken by Mr. W. H. Jackson throughout the West and South and in Mexico. They also furnish views in water-colors, together with lantern slides, either plain or colored, of the

same scenery. Those of our readers who are looking for such views should secure this catalogue.

We have received from Mr. W. H. H. Clark, of St. Louis, a copy of the program of the celebration of the fiftieth anniversary of the St. Louis Lodge, No. 5, of the I. O. O. F., of which he is the honored Noble Grand. It must have been a very interesting occasion, and only regret that we could not be present. We fully appreciate the kind thought in sending the program.

Mr. G. Waldon Smith, the well-known photographer of Boston, recently opened two new studios at Portland and Old Orchard Beach. The latter is for the summer only, and has been remodeled and refurnished in very dainty style. The Portland studio is a very valuable acquisition and promises to be the leading establishment of its kind in Maine, occupying as it does an almost entire building in the most central business portion of that city. All the work, so far as relates to finishing, will be done at the Boston establishment. Mr. Smith, it is understood, will also build two other studios in growing cities this fall. He well deserves all the success he has achieved, and we hope he has caught the tide "which, taken at the flood, leads on to fortune."

Mr. George A. Ayers, the genial and well-known traveler for the house of our publishers, returned from Europe on Wednesday, September 16th, on board the *Teutonic*, after two and a half months' absence. Refreshed and invigorated for a fall compaign, he will soon be on his way among his many friends in the West.

Joseph Mayer, of Newport, R. I., has notified us that two hand cameras have been stolen from him. He gives the following as the method of work by the thief. He works the business by asking you to send (generally two) cameras to his hotel to show lady friends; on arrival he finds they are getting dresses fitted on, so he takes up one camera, which they always like very much. After he takes the second one up he "gets," and that is the last you see of him. A general outline of the business might be of use to your readers, as he is more than likely to call on some of them in his travels.

We understand that the American Aristotype Paper Company have made such a success with their manufacture in the West and Northwest, that they have determined to enter the territory of New York about October 1st next. There is no doubt about their success in the West, and their paper is used by the leading photographers of that section. we anticipate they will be equally successful in New York.

Colonel V. M. Wilcox, the President of the house of our publishers, had another pleasant reunion with his old regiment, the 132d Penna. Volunteers, at the battlefield of Antietam, the other day. He delivered one of his happy and appropriate addresses, recalling the fact that his regiment was only three weeks old when they received their baptism of fire on that bloody field. Dr. R. W. Wilcox, son of the Colonel, presented the Veterans with a flag on behalf of the Sons of Veterans.

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Evening Post Job Printing House, N. Y.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. OCTOBER 10, 1891. No. 19.

THE INTERNATIONAL PHOTOGRAPHIC CONGRESS AT BRUSSELS.

THE Second International Congress of Photographers was held at Brussels, on August 23d last. We are not yet in receipt of the official reports of the meeting, but from the published accounts in our French exchanges we can give our readers an outline of the deliberations of the members assembled.

One of the first questions that occupied the congress was the laws regulating the rights of photographers in the matter of their pictures. After much discussion it was decided that they should be placed on the same footing as artists and the authors of intellectual works. As a natural sequence to this question came the ownership of the negative, and this also led to a large amount of controversy. It was finally agreed that the negative is the property of the photographer, but not to be used without the consent of the model. The destruction of the negative may be demanded by the model if the photographer is indemnified. This decision is the same as that arrived at by the congress of 1889, at Paris, and it appears to us it is just and should settle this much-discussed and important point.

On the question of the mounting of objectives an addition was made to the series of numbers adopted at Paris. At the suggestion of Mr. Warnerke, of England, it was proposed that a new series be adopted in millimeters, and corresponding exactly with the inches used in England. This proposition was opposed, but after a long discussion it was decided to have one series only, adding new dimensions completing the series adopted in 1889. There will be then the numbers 20, 25, 30, 40, 50, 60, 75, 80, 100 and 125 millimeters for the mounts of the photographic objectives.

The congress adopted the unit of light recommended by Mr. Buquet. This is the quantity of light received from a decimal candle placed at one meter, acting for one second on a square centimeter of surface. It was decided to call this

quantity of light a *phot.* As a development of this same idea it was voted by the congress to have the unit of sensibility for photographic preparations a gray tint obtained after development with an illumination of one phot. That is, the density obtained after an exposure to the decimal candle for one second on one square centimeter and from a distance of one meter.

Upon the question of the sizes of plates the congress voted to adopt three series of sizes. These are to be in the ratio of $\frac{2}{3}$, $\frac{3}{4}$ and $\frac{1}{1}$, the greatest length of the normal plate to be 24. The following table gives the dimensions adopted:

			Normal Plate.		
Series $\frac{2}{3}$	8 x 12	12 x 18	**16 x 24**	24 x 36	32 x 48
" $\frac{3}{4}$	9 x 12	12 x 16	**18 x 24**	24 x 32	36 x 48
" $\frac{1}{1}$	8 x 8	12 x 12	**24 x 24**	36 x 36	48 x 48

In the preparation of baths and developers for photographic purposes the congress recommended the following rules:

The components of a mixture should be ordered in parts by weight, and the quantities should be given as far as possible in figures that exclude the use of fractions.

In the formulas of combinations 1,000 parts are recommended as a standard quantity.

By preference the gram is adopted for parts by weight and the cubic centimeter for parts by volume.

The components of a mixture should be given in the order in which they should be introduced into it.

It was also proposed that there should be established an international union of photographers with members in all countries and with a BULLETIN giving the reports of the congresses and an *Annual* giving a summary of the work of international action on photographic questions of dispute. The membership of the union is placed at 20 francs a year and the headquarters at Brussels. A committee was appointed to complete the plans and to report at the next congress, which is to be held in Belgium within a year, and the one following is to be held in Switzerland.

Such is a very brief resumé of the work of this important congress. It is aiming to put photography on the same footing as the other arts and sciences, and to formulate systematic methods of working, in all of which we wish it Godspeed.

EDITORIAL NOTES.

A MOVEMENT has been started in England by the Camera Club, which may be followed to good advantage by some of our clubs, consisting of a series of elementary lessons with demonstrations in the practice of photography for the aid of its younger members.

A SUIT of interest to photographers has lately been decided in Allentown, Pa., against a firm of photographers who endeavored to collect a bill of $20 for work (enlargements) which defendant claimed was not a fair representation of the originals.

IN a recent bicycle race, which was declared by the judge to be a dead heat, a photographic negative, exposed at the instant of crossing the line and developed

after the decision had been rendered, distinctly showed that one of the riders was clearly ahead of the other. How should such a case be treated?

The death is announced on the 7th of July last, of Emanuel Mariot, director of the Photographic and Photo-Chemigraphic Division of the Austrian Military Institute in Vienna. The discovery and development of the heliogravure process was due to his efforts, as well as many other important works in this branch of the art. He was the recipient of several decorations in recognition of these services.

The amateurs of Bangor, Maine, are proposing to start a club, which up to this time Bangor has been without. It is never too late to mend, and we wish them success.

The very extensive work undertaken by the Pennsylvania Railroad in photographing its immense length of route on a very large scale is progressing well, about 400 18 x 22 negatives having been made of many of the beautiful views along the road. Mr. Rau, the operator for the road, has had also a panoramic camera built for this work, which makes an exposure on a film 18 x 42 inches. Mr. Rau's best camera is said to have cost him $1,000. The accommodations furnished by the railroad company for this work are in every respect sumptuous.

Two interesting relics of war time are said to have been unearthed in an old Washington building lately, in the shape of hitherto unheard-of portraits of President Lincoln and Gen. Grant, which are reported as being excellent likenesses of each. The negatives at the time of the sitting did not please the operator, who had thrown them aside and they have thus remained in oblivion all these years.

The Schuylkill County Camera Club, of Pottsville, Pa., have unanimously decided to enter the Boston and Photo Conference Slide Exchanges, which will enable them to enjoy several pleasant evenings in examining the work of their fellow clubs in the exchanges.

The Springfield Camera Club has made arrangements for their Annual Exhibition, to take place November 1 to 15. They have also extended the time first set for sending in prints in the contest for illustrating Tennyson's "Song of the Brook" to November 1st.

When we think of the fact that Mr. H. P. Robinson, of England, has been satisfied with one form of developer for all of his beautiful work, we cannot wonder that so many failures are made by operators of much less experience from constantly changing their formulas. Mr. Robinson's developer is composed of:

No. 1.

Pyro	1 ounce.
Citric acid	40 grains.
Water	7½ ounces.

No. 2.

Bromide potassium	120 grains.
Ammonia, 880	1 ounce.
Water	7 ounces.

For use he adds to 3 ounces water 2 drams each of Nos. 1 and 2.

THAT portion of the building of the American Institute which is to be used by the Society of Amateur Photographers during the coming exhibition is admirably suited to the purpose, and we anticipate a handsome and exceedingly interesting display. It should be seen by all.

DR. STOLZE, of Germany, recommends a new method for obtaining intense prints from negatives of old paintings which are usually so lacking in printing qualities. He advises printing with short exposure on bromide paper and developing with eikonogen as hard as possible, only keeping the whites clear. After fixing, the print must be thoroughly washed and then it should be bleached in a solution of bromide of copper. After another complete washing it is redeveloped with eikonogen.

WILH. SCHLEIFER, a well-known amateur on the other side, gives the following as an excellent method of obtaining vigorous prints from flat and thin negatives. A gelatine plate of slow sensitiveness is placed in the printing frame under the negative and exposed under light-green glass to candle light for about five minutes at a distance of about forty inches, after which it is developed in an old bath of

Hydroquinone	1	gram.
Soda	4	grams.
Sodium sulphite	5	"
Salicylic acid	0.5	gram.
Water	200	c.c.

Fifty to sixty seconds in this developer should bring out the first traces of the image; if it appears sooner the developer must be diluted; at the end of one minute the plate should be removed and placed in a more concentrated bath made exactly like the former, only that 100 c.c. of water is used instead of 200. Development is carried until the image is faintly to be seen on the back of the plate, when it should be washed, placed in an alum bath, 1:10, for five minutes, and cleared in a solution, 1:8, of hypo and thoroughly washed. A negative is then made from this diapositive in the same way, but giving a longer exposure, from a half to two-thirds more, according to density. The final print should be on gelatino-chloride paper, printed very deep under a light-green glass, as in the first instance. If a green glass of the proper color is not at hand it may be prepared by floating a clean glass with warm gelatine, 1:10, and after it has set, hardening with alum and soaking in a solution of methyl green, 1:10. The color should be removed from the back of the plate with warm water.

THE Capitol Camera Club has been formed in Washington, D. C., with Albert Le Breton, President; John Everett Mitchell, Vice-President; and F. B. Dante, Secretary-Treasurer. The club's quarters are at 401 7th Street, N. W., and it is in a very flourishing condition, though only organized in May last.

DR. MUSEHOLD, of Berlin, has invented a very ingenious camera for photographing the interior of the throat, by which he has succeeded in obtaining some valuable negatives with the aid of magnesium flash. The shape of the camera is that of a long, thin case, much resembling an ordinary drop-shutter, and so arranged that the plate passes behind the lens and is cut off from the light by a shutter working within. The pictures are reproduced from four-fifths to five-sixths of the natural size of the throat.

We note with pleasure that there is some talk among the amateurs of New York City about securing some permanent building near the heart of the city for the founding of an institute of photography, where the principles underlying its practice may be acquired by beginners. We hope the scheme will find encouragement and support enough to establish it.

ENGLISH NOTES.

The American who complained that in England we had no "weather," but only "samples," would see cause to change his opinion if he could have spent this summer in England. We have had rain—steady, monotonous rain—all day, and (nearly) every day. The whole country is a mass of luxuriant green, for the grass and the leaves seem to enjoy the wet; but the British farmer is distracted, and the photographer shares the depression of the farmer. The professionals are all grumbling, for there is a fixed idea in the mind of the "public" that bright sunshine is necessary for a good portrait, and so the studios are deserted. The amateur goes down to the seaside with a large stock of plates; spends a few days counting the rain-drops which continually race down the windows, and then returns to town disgusted. The stock dealers in turn feel the depression, and so it is "bad all round."

For my own part, I have been rather fortunate, for what little fine weather was floating about the British Isles appeared to concentrate itself on the northern horn of Wales, the Promontory of Lleyn, which I had selected as the happy hunting-ground for self and camera. It is a fortunate thing that the Welsh people have so patriotically preserved their language and racial characteristics. Here, within two or three hours' railway ride from Liverpool, we have a people speaking a distinct language, the women wearing a picturesque dress (unfortunately this is being replaced by modern "fashions"), and inhabiting a mountainous and sea-girt tract full of food for the camera—waterfalls, rocks, breaking waves, black cattle, hardy fishermen, coast cliffs, old-fashioned boats and ships, cromlechs and caves, quarries and precipices, waterwheels and windmills, ravines and secluded valleys, peaks and moorland—a little country, but a happy and prosperous one. Unfortunately, those parts of the North Wales coast nearest to England, the towns of Rhyl, Llandudno, etc., are being spoilt by the great influx of cheap trippers from English manufacturing towns. During my three weeks' stay in Lleyn I exposed about fifty whole plates and made a like number of "shots" with a hand camera. With settled fine weather these numbers would have been considerably exceeded.

The camera is a splendid passport, and one comes across students of photography in the most unexpected quarters. Venturing timidly near a farmyard, we were received with open arms by the farmer, himself the proud possessor of a quarter-plate camera, and the resources of the establishment were exhausted for our benefit. A lighthouse-keeper from a little storm-beaten isle made a special journey to the shore to ask our advice about development, and we afterwards had a shot at more than one passing vessel from his eyry.

The light being so changeable and of such great actinic power when the sun shone between passing showers, correct exposure was a matter of great difficulty. In the development of the over-exposed plates, a 10 per cent. solution of citrate of ammonia has proved of great service. As soon as the image "flashes

up" a certain quantity of the citrate—about half a dram for each ounce of the developer—is added to the solution; or the plate is removed and washed for a few minutes in a 5 per cent. solution of the citrate. This arrests the appearance of detail and prevents fog. The plate can then be returned to the developing solution, which can then be strengthened until the desired result is obtained.

There are two points in development to which it seems to me that amateurs generally hardly pay sufficient attention. The first is to commence with a weak developer, and gradually strengthen it as required. The formulas sent out by the makers with their dry-plates are too strong to begin with. Try taking one-fourth of each ingredient to the total quantity of water, and then add the remaining three-fourths (if necessary) by installments. The second point is not to hurry development, nor to remove the plate too soon from the developing solution. The studio professional, with his scores of negatives to develop daily, and his certainty of correct exposure begotten by long practice under the skylight. can afford to take only three minutes to each plate ; but for out-of-door work and by casual workers, twenty to thirty minutes ought to be devoted to the development of each plate. That is if you want to get the best result possible. If less satisfies you, well and good.

My tricycle I found a boon, even in the wet weather and over the stony roads of wild Wales. I am no lover of "walking for walking's sake," and the machine aided materially in reducing the uninteresting distances between one "worthy of being photographed" object and another.

The meeting of the British Association just concluded at Cardiff, in South Wales, seems to have been below the average in interest and attractiveness. The President, Dr. Huggins, the famous spectro-astronomer, paid a due meed to the immense aid which photography is rendering to those who study the heavens. He complained somewhat of the granularity or texture of the gelatine dry-plate, which renders high magnification of the stellar, etc., negatives obtained practically impossible. At present, granularity and rapidity go together. Can any maker produce a rapid dry-plate, the bromide of silver in which shall be so finely divided as to be of the nature of a stain? If so, the astronomers would be glad to hear from him.

The researches by Carey Lea, the famous Philadelphian chemist, into the allotropic modifications of silver, have attracted much notice on this side of the Atlantic. In some lectures recently delivered before the Society of Arts, Professor Meldola urges the possibility that the blue, yellow, etc., forms of silver obtained by Lea may owe their colors to impurities which may be present. To quote Meldola's own remarks : "The experiments of Carey Lea demand some notice. By reducing certain organic salts of silver, viz., the citrate and tartrate, with the corresponding ferrous salts, this experimenter professes to have obtained three allotropic modifications of silver. After carefully considering the conditions of formation, and after repeating some of the experiments, I must say that there appears to me to be no sufficient evidence that these colored forms consist of the pure metal. On the contrary, all the evidence goes to show that some impurity is present.* The published analyses of the products in no case show a greater percentage than 98.75 per cent. of metal. If an alloy of gold,

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*Thus, in repeating these experiments, Prange (*Rec. Trans. Chim.*, ix, 121) found that the dark substance precipated from the solution of the so-called "soluble silver" always contained traces of iron as an impurity.

containing only 0.2 per cent. of lead, differs so completely from pure gold as to be brittle instead of malleable and ductile; if the colors of many metals can be completely modified by being alloyed with small quantities of other metals, such, *e. g.*, as the deep purple alloy of aluminium and gold, it is not unreasonable to suppose that the color and other properties of precipitated silver would be modified by combination with 1 per cent. or more of some impurity which may consist of an organic iron salt. At any rate, it seems premature to speak of these products as allotropic forms of silver." What does the Sage of Philadelphia say to this?

Dr. Nicol has improved his Kallitype printing process, and the "Kallitype No. 2" gives results much resembling platinotype, at half the price and with less trouble. This process clearly has a future before it. The paper is exposed in contact with a negative for five minutes; soaked in the developing solution (cold) for fifteen minutes; then in a weak ammonia bath for ten minutes; it is finally rinsed in water and dried. The resulting image is in silver, and any tone, from red to black, can be obtained. Among those who much prefer this method to ordinary silver printing on albumen paper (with its meretricious glaze), accompanied by troublesome gold toning and a bath of hypo, which adds the seeds of yellow fever to the print, must certainly be numbered

TALBOT ARCHER.

THE CHEMISTRY OF SILVER AND ITS SALTS, AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

(*Continued.*)

ARGENTIC CHLORIDE—SILVER CHLORIDE—AgCl.

SILVER chloride is precipitated as a white flocculent substance in decomposing a soluble silver salt by hydrochloric acid. It is not decomposable by heat, melts at 500 degrees Fahr., and in cooling agglomerates to a gray mass, which can be cut like horn, hence the name of *Diana cornea* given to it by the alchemists.

When melted with metallic silver it renders it very soft and malleable by mechanically uniting with it.

It is insoluble in cold and boiling water, also in calcium and zinc chlorides, sparingly soluble in nitric and hydrochloric acids. The latter dissolves $\frac{1}{200}$ part of it, and in cooling or by evaporation deposits it in octohedra.

It dissolves without alteration in ethylamine, methylamine and ammonium hydrate. From the latter solution it is obtained in micaceous spangles by evaporating the solvent at a low temperature, for by boiling the chloride is converted into fulminating silver. The ammoniacal solution, neutralized by nitric acid, deposits all the silver chloride.

Hydrobromic and hydriodic acids transform silver chloride into the corresponding salts, silver bromide or iodide.

Sulphuric acid converts it into sulphate, with formation of hydrochloric acid.

Potassium cyanide and sodium thiosulphate (hyposulphite) transform it into silver cyanide or thiosulphate, forming a double salt when the solvent is in excess:

$$2KCy + AgCl = KAgCy_2 + KCl.$$

Sodium chloride dissolves 0.0017 part of its weight of silver chloride at the

temperature of 50 degrees Fahr.; 0.0024 part at 60 degrees, and 0.0068 part at 212 degrees.

Silver chloride absorbs one and half an equivalent, or 17.45 per .100, of ammonia gas, which it gives off at 98.5 degrees. The compound $2AgCl, 3NH_3$, is more sensitive to light than silver chloride.

Potassium and sodium hydrates are without action on silver chloride in the cold, but by boiling they convert it into silver oxide, which is rapidly reduced to metal by the addition of sugar or glucose.

The carbonates of the alkali metals, the oxides and carbonates of the alkaline earths reduce it at a bright red heat.

Metallic copper reduces it in presence of ammonium hydrate.

The metals easily oxidizable—iron, zinc, cadmium, copper—reduce it in presence of water, but more rapidly when the water is acidified with hydrochloric or sulphuric acid. Sodium chloride accelerates the chemical action.

Mercury reduces it slowly and partially only.

Stannous and cuprous chlorides reduce it, being transformed into stannic and cupric chlorides.

Silver chloride exposed to the action of light assumes a violet, then a brown gray, and finally a gray black color, giving off chlorine. The reduction is more rapid in presence of substances capable of absorbing chlorine; such are ammonia, cuprous chloride, ferric chloride, stannous chloride and silver nitrate. The latter is necessarily converted into AgCl, which is the nascent state, is rapidly reduced. The printing out photographic process is partly based on this action.

The color of the reduction of silver chloride varies with the color of the light which impresses it.

Silver chloride does not blacken by exposure to light in presence of mercuric chloride (Rose) and in an atmosphere of chlorine.

The chemical change effected by light is not scientifically ascertained. Whether AgCl is reduced into Ag_2Cl or a mixture of Ag and AgCl is a question.*

Argentic Bromide—Silver Bromide—AgBr.

Silver bromide, the other haloid salt of silver, is prepared by double decomposition, by action of potassium bromide on silver nitrate in solution. Its properties are similar to those of silver chloride. It is insoluble in water, soluble in aqueous ammonia, ammonium chloride, mercuric nitrate, sparingly soluble in hydrochloric and hydrobromic acids.

It is decomposed by potassium cyanide, sodium sulphite and thiosulphate, forming salts which are soluble in these compounds in excess.

Hydriodic acid converts it into silver iodide.

Hypochlorous acid transforms it into chloride and bromate.

Nitric acid has no action upon it.

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* Consult on this subject: F. Guthrie, "Action of Light upon Chloride of Silver," *Quarterly Journ. of the Chem. Soc.*, 1857. Reprinted in Humphrey's *Journ. of Photo.*, vol. ix.—Dr. Monckhoven, *Bull. Soc. Franc. Photo*, 1859, p. 324.—Davanne and Girard, *ib.*, p. 329.—John Spiller, "Composition of the Photographic Image," *Philos. Magazine*, March, 1860.—Th. Sutton, *Photo. Notes*, 1863.—Von Bibra, *Journ. Prac. Chem.*, vol. cxxii (1875), p. 39.—S. B. Newbury, *American Chem. Journ.*, 1885. Reprinted in Anthony's Bulletin, April, 1885.—W. de W. Abney, "The Photographic Image," *Journ. Photo. Soc.*, Great Britain, 1885, or Anthony's Bulletin, July and October, 1885.—P. C. Duchochois, Anthony's Bulletin, vol. xv, Nos. 6 and 11, and vol. xvi, No. 11.

Sulphuric acid converts it into silver sulphate, with evolution of bromine.

When suspended in water it is decomposed by chlorine.

It does not absorb ammonia.

Silver bromide is more rapidly impressed by light than any other salt of silver, "the most decided action is evident before the eyes can detect any change in silver chloride" (R. Hunt). It is acted on by rays which have no action on silver iodide, the reduction, according to Herschel, extending to the red of the spectrum with the maximum of action in the indigo.*

Under the influence of heat silver bromide undergoes several molecular changes which, seen by transmitted light, appear ruby, green or blue gray.† In these various states it is differently impressed by the colored rays of the spectrum ; the ruby modification is sensitive to the violet, to the blue and slightly to the green rays ; and the gray blue to the same rays and the red. According to Captain Abney the green bromide formed in a collodion emulsion specially prepared by him is sensitive to the infra red.‡ The blue gray modification seems to be the most sensitive in gelatine emulsions.

It is remarkable that Alexis Gaudin also observed three molecular changes in silver iodide, one white, another bright yellow and the third of a fawn color, which is the most sensitive to the luminous influence.§

Silver bromide in presence of mercuric chloride is insensitive to light (Rose) and is almost instantaneously reduced when washed with a solution of stannous chloride (Bingham).

Argentic Iodide—Silver Iodide—AgI.

Silver iodide is a pale yellow powder insoluble in water, and sparingly soluble in aqueous ammonia, which only dissolves $\frac{1}{2500}$ part of it. It dissolves in potassium iodide, forming two crystallizable compounds, $AgI,2KI$ and AgI,KI, which are not altered by light.

It is decomposed by potassium cyanide, sodium thiosulphate and sulphite, which, by excess, dissolve the compounds formed. Nitric and sulphuric acids transform it into nitrate and sulphate. Mercuric nitrate dissolves it.

Dry silver iodide absorbs 3.6 per 100 of ammonia gas, $2AgI,NH_3$, which it gives off in the air.

Iodine has a greater affinity for silver than either chlorine and bromine, and the latter a greater affinity than chlorine. "When bromide of potassium is poured upon chloride of silver an entire decomposition ensues, bromide of silver and chloride of potassium are formed. When iodide of potassium is added to chloride of silver, iodide of silver and chloride of potassium are produced, and where iodide of potassium is added to bromide of silver, there is a similar decomposition, the iodine replacing the bromine. When chloride of silver in excess is agitated with iodide of potassium and warmed for some hours, no trace of iodine can be detected in the solution. When, however, chloride of sodium is poured upon iodide of silver no decomposition occurs. Neither is there any action upon bromide of silver with the same salt ; and when bromide of potas-

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* *See* Dr. H. W. Vogel's "Practical Spectrum Analysis," *Nordlinger*, 1877.—Dr. J. M. Eder, "The Chemical Effect of the Spectrum." *Photo. Journ*, 1881–2.—And "Behavior of the Haloid Silver Compounds in the Solar Spectrum," Anthony's Photographic Bulletin, 1885.

† J. S. Stas, "Recherches sur le chlorure et le bromure d'argent." *Ann. chim.* (5) vol. iii, p. 289.

‡ Capt. W. de W. Abney's "Photography with Emulsion," and Proc. Royal Society. 1881. No. 217.

§ La Lumière, 1862.

sium is added to iodide of silver, there is no alteration in the union of the elements."*

Pure silver iodide is not chemically altered by light. In presence of silver nitrate it is reduced into a brown compound which, treated with nitric acid, changes color to pale brownish tints. A similar action takes place if an organic substance is added together with silver nitrate. The compound blackens from the reduction of the organic salt, which is decomposed by the nitric acid, leaving the silver iodide little altered. Organic substances such as albumen and gelatine do not seem to promote the reduction of AgI to a great extent. It is slightly discolored after many days insolation and becomes yellow again if treated with nitric acid. But when organic substances containing tannic acid or its derivatives are mixed with the pure silver iodide, the reduction proceeds rapidly. With pyrogallol it turns steel blue, this color being changed into a bluish gray by nitric acid.

Ammonia whitens silver iodide, and if it is then exposed to light it becomes of a gray color, which bleaches under the action of nitric acid.

Insolated in water with sodium carbonate, silver iodide turns slightly brown. Nitric acid also destroys this color, which becomes gray.

None of these phenomena occur with silver chloride and bromide.

The constitution of the latent image, or, in other words, the action of light for a fraction of one second on silver chloride, bromide or iodide is still in the domain of hypothesis.†

Silver Cyanide—AgCy.

Silver cyanide is insoluble in water, very soluble in aqueous ammonia and potassium cyanide, forming a double compound with the latter. Sodium thiosulphate decomposes it. Hydrochloric acid converts it into chloride with evolution of hydrocyanic acid.

Silver cyanide is very slowly acted on by light. It turns gray or brownish-gray when organic matters are present.

(*To be continued.*)

As long as I do anything at picture making, and the Bulletin is published, I want a copy of every issue. J. M. Welden.

That I prize the Bulletin is evident from the nicely-bound volumes for the past six years which adorn my book shelves. A. L. Colton.

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* Fred Field "On the Separation of Iodine, Bromine and Chlorine, and the Comparative Affinity of these Elements for Silver." *Journal London Photo. Soc.*, 1859.

† On the Action of Light on Silver Iodide, etc., etc.: Ed. Becquerel's work. "La Lumière, ses causes et ses effects," vol. ii, p. 89 *et seq.*—R. Hunt's "Photography." London, 1851.—"Theory of the Daguerreotype," a reprint of the paper published in the *Philosophical Magazine* for December, 1844, by G. Shaw and Dr. Percy.—"Zantedeschi's Experiments upon Sensitive Iodide of Silver." *Photo Notes*, 1857.—Barresvill et Davanne, "Chimie Photographique." Paris, 1861.—T. Worden's Chemistry of Photography. *Photo. Notes*, 1862.—Th. Sutton, Loc. cit. 1862.—A Gaudin, Loc. cit. 1862.-Dr. Von Monckhoven's "Theory of the Photographic Process." *Photo. Notes*, 1863.—F. Fred. Hardwich's *Manual of Photographic Chemistry*. London, 1864.—Carey Lea's *Manual of Photography*. Philadelphia, 1871. Also his researches in Silliman's Journal (2), vols. xxxix, xl, xlii, and (3), vol. xxxiv, and *Bull. Soc. Francais Photo.*, 1865. *Phila. Photographer*, 1866.—Dr. H. W. Vogel, *Bull. Soc. Chim.* (2), vol, i, and his work "The Chemistry of Light and Photography." New York: Appleton.—A. Poitevin. *Bull. Soc. Chim.* (2), vol. v.—See on the Action of Light: "The Curious Experiments of Moser, of Konigsberg, communicated to the French Academy of Sciences by Mr. Regnauld, and the communication of Moser, *Comp. Rend.*, vol. xv, "Memoire sur une nouvelle action de la Lumière," by Niepce de St. Victor. *Comp. Rend.*, 1857–58. Partly translated in *Humphrey's Journal*, vol. ix.—"Thermography" in R. Hunt's *Photography*.

A LITTLE SERMON.

BY "AN OBSERVER."

A few years ago the demonstrator from a dry plate or photographic supply house was always sure of a pleasant greeting in the gallery. He always had the latest hints and wrinkles, and as he was a good fellow and knew all that was going on he had, on general principles, a warm welcome from proprietor, operator and the dark room man. Although dry plates had been in use for a goodly number of years there were still to be found people who did not "know it all." There were some who still wanted information on the subject. The use of dry plates was not universal. There were galleries that did not use them for portraits. Others made only children's negatives on them. A few were employing both methods and worked dry plates on dark or yellow days and kept the bath for favorable occasions. Now how all this has changed! Everybody uses dry plates. Apparently everybody and his man has come to the conclusion that they know all about them.

Now the demonstrator comes in and asks the question: "Do your plates work all right?" The answer is quick and sharp: "If they don't I send them back, for if they wont work I do not want 'em." The gallery has been using the plates which Mr. Demonstrator represents, but seems to have stopped, so the question to be asked is a delicate one. But the reason must be found. The next question is: "How are you getting on with our plates?" "I have a better thing now." "I worked yours some time ago, but was not satisfied and am using B——'s now."

"Got any of ours left?"

"Yes."

"Let me try them for you?"

"No, It isn't worth while. I am satisfied with what I have got."

"Well, will you let me see some of the negatives you made on our plates?"

"Oh! Yes, certainly."

Out come three or four negatives. Here is the nice point. It will never answer to say that the plates have not been properly handled and that they have had four seconds exposure when one would have been ample. So there is a little more skirmishing, and finally, upon the demonstrator's further expression of a desire to try one of the old plates, a box is found. A good subject happens in and the demonstrator makes a beautiful negative. Then he makes another, and finally a third. The operator says: "I had no idea they were so quick." At last, after careful management, he is won over and says: "I am much obliged to you. When can I get some of these plates?"

Here was a little game that had entirely escaped the owner's observation. The operator had taken hold of a strange brand of plates, and found he could not work them. He experimented as far as he dared; had no idea of what fault he was in, and so to save his own reputation complained to the owner that the plates were bad. Then he asked for a brand he knew he could handle. So the plates were put in stock and the kind he asked for were obtained. After that he got along very well.

Dry plates are now so generally in use that a man dares not admit that he does not know it all. He would consider it fatal to his reputation with his employer to have it suggested that he had anything to learn. At least that posi-

tion is the one commonly taken. The result is that perfectly good plates get a bad reputation and are thrown out of galleries where they have been used with satisfaction for some years.

The incident just given happened during the past autumn in a studio where the writer happened to be, and came to his knowledge, as he was a personal friend of both the interested parties. When the operator took hold of the plates he found that something was wrong. He could not make satisfactory negatives, and he had no time to experiment. Work was pressing, and he did not dare to ask advice nor confess ignorance. The latter would have been suicide in his eyes, for he had professed to know it all. Probably the proprietor would have had small confidence in the man if he had for once admitted that there was something that he did not understand. Under these circumstances his only resource was to condemn the plates, which he did with promptness.

The wise plan would be to take hints whenever they are obtainable. The demonstrator usually has something useful to impart. It cannot be otherwise. He is going from place to place. He sees all that is new and good, and is welcomed in studios which are practically closed to the profession. His knowledge is at the service of every one, and he can impart many a useful hint, even to those who have been longest in the business.

There is a moral to all this. Do not condemn a plate because you don't happen to make good negatives on it this week. Spots have been known to break out suddenly on a new batch of silver paper, not because of any fault in the paper, but because the printer suddenly fell into a bad habit of which he was unconscious. Bad habits sometimes establish themselves very suddenly in both operating and dark rooms.

Here is a word both for the operator and the demonstrator. When a bad habit or faulty manipulation is suspected, do not rest with simply proving that a good negative can be made. It is one thing to know that the thing can be done, quite another to have the operator able to do it. Therefore put the plate in the operator's hands and allow him to do all the work. Watch the development as much as you please, but do nothing. If errors are committed, the demonstrator has all opportunity to note them, and the operator becomes certain that each step he takes is correct.

If any one wishes for proof that this is the correct method, let him undertake to teach a beginner how to make bromides. If the person has but small knowledge of photography so much the better. Now, if all the steps are shown and the novice allowed to go alone, there will be trouble. But set the novice at work under your own eye and see the difference. You will detect blunders of the most surprising and original character, and having found the sources of trouble in the beginning it will be easy to keep your pupil in the way in which he should go.

[*From Photografisches Archiv.*]

REACTIONS OF THE MOST GENERAL ORGANIC DEVELOPERS.

BY DR. J. SCHNAUSS.

The question was raised some time ago in the *Amateur Photographer* in what manner ready-made developers of hydroquinone, eikonogen and hydroxylamin hydrochloride could be distinguished from each other? As this could be

done by characteristic chemical reactions, it would be necessary above all to separate the developing body from its companions, particularly from sulphite of soda and alkali, with or without carbonic acid, every reaction being influenced too much by their presence. A complete separation is not easy, perhaps not possible, particularly when the developer is not quite fresh, and the respective body has already been partly decomposed, that is, oxidized. This is also true of the sulphite of soda, so that for instance old hydroquinone developer, mixed with an acid, developes only carbonic acid, and not sulphurous acid. But if the respective reducing body is in fresh solution or in solid form, a number of characteristic and interesting reactions will take place, with whose investigation I have lately occupied myself. I tested only the four most general organic developer—hydroquinone, eikonogen, pyrogallic acid and hydroxylamin hydrochloride. It has been again confirmed that eikonogen and pyro possess the most powerful reducing properties, but in consequence of which they are also the most inconstant in their solutions.

When heated in a closed glass tube only two of these reducing agents can be sublimated without decomposition—hydroquinone and pyro, but a small carbon residue will always remain.

Regarding the solubility in water the pyro is ahead, then comes the hydroxylamin, eikonogen and hydroquinone.

If these solutions are exposed to the air in open shallow dishes by replacing the evaporating water at about equal strength of the solution, the decomposition commences in the following order: pyro, hydroquinone, eikonogen, hydroxylamin. The latter remains unchanged. By addition of a few drops of carbonate of potassium the coloration proceeds in the same order, of course instantaneously. The hydroxylamin keeps colorless for a long while.

I have made a number of tests with the above four developers without discovering any great characteristic signs by which they could be distinguished, with the exception of iodine, bromine and copper acetate. If a few drops of a solution of the latter are added to the eikonogen solution the blue copper color will change into green; by addition to the hydroquinone the copper solution will assume a yellow color. Both remain clear. By addition to the hydroxylamin the copper solution discolors. The most remarkable action is with a solution of pyro, which produces at once a grayish-black precipitate. When heated the solution mixed with eikonogen will first separate a brick-red oxide of copper. The hydroquinone solution will do the same when boiling, while hydroxylamin remains colorless, and the precipitate which formed in the pyro solution remains unchanged, grayish-black.

Hydroquinone, as well as eikonogen, combine with iodine as well as with bromine to form a handsome crystallizing body. Iodo and bromo-hydroquinone are constant and durable; the crystals of eikonogen melt in the open air and decompose. If a few drops of strong bromine water are added to a strong solution of hydroquinone and the bottle is well shaken, the color and smell of the latter will disappear and seemingly black crystalline needles of a metallic gloss will soon precipitate. If the alcoholic solution of this compound is left to free evaporation in a shallow tray, magnificent needles of a golden gloss of more than 1 cm. in length will form. By transmitted light they appear brownish-red. The compound of hydroquinone with iodine is quite similar. Both compounds are hardly soluble in water. A strong eikonogen solution mixed with a little tincture of iodine will

soon give a precipitate of white crystals in needle form, which even in boiling water and alcohol are difficult to dissolve. If exposed to the air, as above mentioned, they will soon decompose. The compound of eikonogen with bromine dissolves easier in water and decomposes also pretty soon. The bromo-hydroquinone can be sublimated, mostly undecomposed, in small crystals similar to sublimated iodine.

In the theory of the development of bromide of silver films the tendency of hydroquinone and eikonogen to absoib bromine has heretofore been disregarded and this part was assigned only to the alkali. It was now interesting to know the action of pure hydroquinone and eikonogen and their bromo-compounds upon exposed bromide of silver. I made the tests on account of the simplicity in beaker glasses, into which strips of exposed bromide of silver plates were immersed; under similar conditions I tested also pyro and hydroxylamin. The bromide of silver coating darkened most rapidly in eikonogen solution and pyro solution, and hydroquinone acted almost as quick. Hydroxylamin hydrochloride was without action, but dissolved the bromide of silver film from the glass. With bromo-hydroquinone and bromo-eikonogen the exposed bromide of silver film did not color in the least, likewise pyro mixed with bromine; hydroxylamin with bromine colored the film very faintly under strong development with ammonia, which was probably the cause.

A strong pyro solution mixed with bromine water colors the mixture at first dark yellow, and the smell disappears; finally the color disappears almost entirely. A crystallizable compound I have not observed yet.

For the above tests I have used pure hydroquinone; but also the so-called permanent hydroquinone of Dr. Byk behaved just the same, and reduced copper acetate also, but not before boiling; if it contained sulphite the reduction would have taken place at once and in the cold.

The eikonogen was from Dr. Andresen, in a powdery condition.

The black precipitate produced by pyro solution in acetate of copper behaves in a peculiar way. Heated upon a platinum foil it burns by emitting sparks without leaving any residue worth mentioning. In muriatic acid it dissolves to a brown, clear liquid, in which ammonia produces a precipitate exactly equal to the original body; the liquid is not colored brown. Carbonate of soda acts quite similar to ammonia. In the muriatic acid solution no copper can be proven even by pure iron; if the solution is boiled with a few drops of nitric acid it remains light yellow, and ammonia in excess produces no blue coloration. After evaporating the nitric solution, an amorphous brown mass remains. The black body can therefore consist principally only of a decomposition product of the pyro.

[*From The Photographic News.*]

NOTES ON PORTRAITURE.

BY H. P. ROBINSON.

No. IV.

THE greatest difficulty in portraiture has always been the group. This has been almost as much evident to the painter as the photographer. If the painter represents his subjects as simple resemblances they are too often stagy and stiff; if, on the other hand, he supplies them with a center of interest, and presents them as "doing something," they look as though they were doing it for the purpose of being painted, and

who does not recognize the air of conscious sham that pervades the representations of even such spectacular subjects as court ceremonies, although they may be painted by the greatest artists? What is the unfortunate artist to do? In his attempt to be pictorial he meets with many obstacles. He must not partly hide a face, or introduce a back view of a figure, often useful for obtaining variety of pose, and as a foil to other figures; he must show every one at his best; the chief personages must be conspicuous, even if they were not very visible in the real group. Of the painters, Wilkie and C. R. Leslie almost succeeded with these impossible subjects, but it was at some expense of truth. It was left for an impressionist painter to show us what would happen if such a subject were treated literally. In the *Art Journal* for January is a process block from a picture by Mr. John Lavery, representing the ceremony on the occasion of Her Majesty's visit to the Glasgow Exhibition, 1888. The principal object is an official in his robes filling a foreground corner; the reader of the address is a little figure in the distance, and Her Majesty is to be found, after diligent search, some way out of hearing distance of the reader. One half of the space is filled up with the steps of the spacious dais, under the canopy of which Her Majesty is seated almost out of sight. This may have been a correct impression of the scene; the picture may be full of air, and space, and truth of the subtlest kind; it may be full of expression and spirit, and all other impressionist qualities; but if we may judge by the engraving, it does not do justice to the portraits, and thus the principal object of the picture is not fulfilled.

Perhaps the most realistically natural group of two figures ever painted is to be found in the "Portraits of a Merchant and his Wife," by Van Eyck, in the National Gallery. It represents a man and woman standing to have their portraits taken. This is just what they must have been doing, and they look like it. Legends have been invented to explain the subject, and account for the pose of these two marvellously painted figures, but all that is apparent is that they were standing for the painter.

Nowadays, when we want to make figures look "so natural," we are expected to make them appear to be doing anything but pose for their portraits, while they are doing nothing else all the time. What is the most natural thing a boy will do when he is asked to stand for his portrait? He will look at the camera, and be interested in what you are doing with it. This is an argument that may, of course, be carried too far, but there is exaggeration in the other extreme, which has been advocated to such an extent by recent writers on art who talk about nature without understanding, that the unfortunate photographer is now almost afraid to allow his sitter to look at him.

A portrait should not be a snap-shot accident of a man. It should be a deliberate presentment of the best that is in him, portrayed by the artist after a careful study of his subject, and cannot be other than to some extent a conventional representation. It is all very well if you can combine the natural with the portrait, but the effort, even with the greatest artists, almost always ends in the make-believe. Take, for instance, one of the greatest portrait pictures in the National Gallery, the "Family of Darius at the Feet of Alexander the Great, after the Battle of Issus," by Paul Veronese. That event purports to be the subject represented, but the principal figures are portraits of the Pisani family. The picture was intended for a portrait group, and the artist has taken an historical incident of the year 333 B.C., so as to give his figures an opportunity of "doing something" and looking "so natural." To do this he has seen no absurdity in and not scrupled to represent his sitters in Venetian armour and robes of a period more than 1,500 years later than the time of the incident portrayed. It is one of the great pictures of the world; is wonderfully painted; is marvellous in color and handling; not one face looks "at the camera;" but if one looks for the nature that is expected in modern art, one cannot help feeling that the monkey on the balustrade is the most natural bit of the picture.

I do not pretend to argue that no portrait group should have a motive or leading idea; but I feel that this method of composing a group may be often carried too far, and is often strained.

In the last century the group was a favorite method of presenting portraits, and Zoffany, Hogarth, and a few others, in their "conversation pieces," of which we see examples in every exhibition of Old Masters at the Royal Academy, managed to maintain the just medium between the natural motive and the unnatural strain; with others the family group degenerated into burlesque, and was often ridiculed by the writers of the day. The description of the famous classical group in the "Vicar of Wakefield," "by a limner who traveled the country and took likenesses for fifteen shillings a head," is an instance familiar to all who have read that delightful tale and shows the perverted taste of the time. It will bear repeating. It was to be a large historical family piece, for all families of any taste were now drawn in the same manner, and designed to show the superiority in taste of the Primrose family over their neighbors, all the seven of whom had recently been drawn each with an orange a piece—"a thing quite out of taste, no variety in life, no composition in the world." As the Vicar relates: "My wife desired to be represented as Venus, and the painter was requested not to be too frugal of his diamonds in her stomacher and hair. Her two little ones were to be as Cupids at her side; while I, in my gown and bands, was to present her with my books on the Whistonian controversy. Olivia would be drawn as an Amazon, sitting upon a bank of flowers, dressed in a green joseph richly laced with gold, and a whip in her hand. Sophia was to be a shepherdess, with as many sheep as the painter could put in for nothing; and Moses was to be dressed out in a hat and white feather."

This is scarcely an exaggeration of the state of artistic taste at that period. Another less known anecdote may interest the reader who knows the difficulty of composing a portrait group, and pleasing the whims and fancies of his exacting patrons.

One day a wealthy merchant drove up to the door of Hoppner, the portrait painter. Out of the carriage stepped a gentleman and a lady, with five sons and seven daughters, all *replicas* of the parents; as well fed and comely a city-bred family as any within the sound of Bow Bells. "Well, Mister Painter," said the father, "here we are, a baker's dozen; how much will you demand for painting the whole lot of us? Prompt payment for discount." "Why," replied the astonished painter, "why, that will depend upon the dimensions, style, composition, and"—— "Oh, that is all settled," quoth the enlightened merchant; "we are all to be touched off in one piece as large as life, all seated upon our lawn at Clapham, and all singing God save the King,"

[*From British Journal of Photography.*]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

Chapter XIV.—Method No. I.

I THINK it may fairly be considered a disputed point as to the proper order of acquiring a thorough knowledge of and proficiency in the art of retouching. Some hold the opinion that method is the primary necessity, others that a thorough knowledge of all the minute requirements of a negative and how it should be treated should be the first anxiety of an intending retoucher.

Personally, I am somewhat disposed to favor the latter opinion. I have always found that pupils, when once they acquire a certain proficiency in any method of working, cease to direct further attention to the study of the face. This has a very baneful effect in the end. The student falling into this error may secure a very pretty and effective method, but the pictures he will turn out will be thoroughly devoid of that animation and expression so necessary to a true and lifelike portrait. Now, on the con-

trary, when he has given his attention fully to the study of the face, and thoroughly mastered all the effects of light and shade upon the muscles of same, he is in a safe position to start upon acquiring a method suitable to himself for the carrying out of the improvements that may be necessary on any negative which he may undertake to retouch.

As before laid down, it is impossible to know too much about the anatomy of the face, and I honestly advise every one desiring to be competent retouchers to spare no pains in acquiring a thorough knowledge of it before seeking for a method or style of working. By this means, too, there will be no hesitation, while wavering between one style and another, as to what you should do. You work ahead, and, working, suddenly realize the fact that you have acquired a method of your own quite satisfactory and capable of carrying out the necessary treatment of a defective negative. Practice will, then, bring you not only proficiency, but also rapidity of execution. I do not lay this down as a hard-and-fast rule, but, if given a little consideration, I feel confident it will have, at least, sufficient weight to balance what may be, considered liberally, a matter of opinion.

As may be gleaned from these remarks, I have a special method which I would put forward as the only and best one to be adopted by a beginner. One retoucher may have a very widely different style from another, and yet the results be so similar that one could scarcely tell which was which. Of course, in such a case, the two retouchers must have the same sentiments regarding the treatment of the muscles of the face; if they have not (even if their styles be identical instead of broadly different), the most uncultured observer can discern the difference. This again proves the importance of the knowledge of the anatomy of the face, if such were still wanting. It is this same knowledge which marks the difference between the really competent and artistic retoucher and his less instructed comrade.

The first and most necessary implement used in retouching a negative, as all no doubt know, is the pencil, and the method of using same will now claim our primary attention. Having placed the negative on the retouching desk, and seated ourselves in such a position as to secure ease and comfort, we will begin our work. I will not hold exclusively to my own method, but enumerate several of the most approved systems from which a selection may be made, according to the taste or feeling of the student. In times gone by, the negatives, as a rule, came to the retoucher ready for working upon. This was in the old wet plate time. All this, however, has been revolutionized since the almost universal adoption of the dry plate. Now we are obliged to rub a medium upon each negative before we can begin our work, as there is absolutely no tooth whatever to which the plumbago will adhere. I may have something to say later on about the many kinds of medium, but for the present will be contented with saying that a medium must be used. This done, we begin by obliterating the apparent blemishes or transparent spots visible on the negative. Some retouchers do this by dotting the negative on these places, and so depositing sufficient plumbago on the film as is necessary to increase its density so as to harmonize with that of the surrounding parts. Others adopt a touch somewhat like a comma; others, still, hold that a continuous system of circles run over the face will produce the desired result. There are some, however (including many of the most capable retouchers of the day), who adopt lines for their leading treatment. This latter I also hold to be about the best, as by it any desired effect can be produced. I do not mean to convey that the lines are straight or rigid; on the contrary, they may be, and generally should be, slightly curved and graceful. They should, when possible, also follow the lines and muscular drawing of the face, or else we may fail to secure a harmonious result. Let us, therefore, adopt this latter style in treating the negative before us. Personally (and I follow in the footsteps of a good many better men) I recommend the placing of the negative, at times, slightly upon its side, so that we can, with comparative freedom, make a downward stroke of the pencil that will make

a line across the forehead. We must now fill in all irregular and transparent spots and lines (of course, without interfering with the essential markings of the face as before laid down), imparting to these spots and lines, as nearly as we think desirable, the same degree of density as the surrounding portions of the forehead. Of course, if there should be very marked wrinkles on the forehead, they must not be totally taken away, although they may, with advantage, be very considerably modified. It is not at all necessary, or even advisable, to completely fill in the various spots and other irregularities we find on a negative, one or two lines, according to size of defect, drawn through them being sufficient.

By so doing we secure a double advantage; the slight shade or half tone thus left in will lend a softness, and also, when finished, impart a stippled effect to the picture. This result would be quite impossible if we were to completely block out the spots, unless we afterwards made a point of stippling the negative all over. This would naturally entail the loss of much very valuable time, and would be likely to impart an over-labored appearance, without securing the soft and flesh-like stipple so easily attained when the touches are made as above directed. In carrying our work over a face our lines must always take the same direction as indicated by the lines of the skin and position of the muscles. Of course, when these lines run perpendicularly, owing to the contraction of the muscles, we must also modify our touches so as to be in harmony with such conditions. These effects are principally found upon the forehead, and sometimes on the upper lip.

Sometimes, through the contraction of the muscles, hard lines are produced upon the temples, and must not be removed in every face; they may be leading characteristic features, without which the likeness would be seriously impaired. If careless, we run the risk of producing one tint over the entire forehead, which would be ruinous; therefore, we must be sure to leave indications, however slight, of all these markings, and when the broader effects of light are put in, the retention of these indications of form will impart a pleasing and life-like character to our work, which, by other treatment, might easily be lost.

We can now turn the negative somewhat more upright, in order, following the direction of the muscle of the orbit, to soften the lines (should there be any) formed around and about the plane of the temples. We can now place the negative nearly upright while we work upon the frontal depression and also the nose. For the softening and modeling of the furrows under the eyes, certain portions of the nose, and the upper lip, the negative may be turned back so as to facilitate the firm stroke of the pencil, the direction of the stroke as laid down being always strictly adhered to. This turning of the negative I wish to be understood as optional, not necessary, and I only mention it because many, without sound reason, say it should not be done.

The treatment of the labial furrow should be very decided, sufficient density, if possible, being secured at the first application of the pencil, and executed by one long, firm sweep, covering its entire length. Wherever lines running in different directions may cross or meet each other, and necessarily leaving minute defects, it is quite allowable to fill up same with a dot or stipple made with the point of the pencil. We can so proceed, turning the negative constantly as the lines take a different direction, until it assumes an even and delicate appearance all over. The spots having been filled up or cut in the first instance, all after strokes used in the modeling, etc., should be kept well open and equi-distant, or else the work will not be so uniform.

A stroke of the pencil must never be made across a line; always turn the negative so that at a firm, downward stroke the marking may be satisfactorily filled in. In retouching the neck, long sweeping curves should be employed, the negative being almost on its side. In cases where the subjects are very badly freckled, of course there will be necessity for a larger amount of work done with the point of the pencil than is above laid down. But, naturally, every would-be retoucher must use his judgment in such matters, as it would be perfectly impossible to lay down hard-and-fast rules that

would govern all the conditions under which we might find every negative. I think, with these directions well carried out, we can, as far as this method is concerned, lay down the pencil and take up the brush.

It is very seldom that a negative does not require spotting, *i. e.*, removing any transparent spots that may be in the film, by whatever cause produced. This is done by filling the spot with a color (water) made to match the film, or a little neutral tint or violet applied with a finely pointed sable brush. Should a negative have a great number of very fine holes––like pin holes, the result of some defect in the making of the plate most likely—only spot those in the face, as those in the background and drapery will not be very observable to the naked eye. To attempt to spot these out would be absolute madness, as no matter how fine we might try to spot them, we could not do so without making a quantity of white spots visible in the print, and thus entailing more work afterwards to set them right again.

Should the negative be rather poor in quality and lack brilliancy, and so require helping in the lights, we must matt varnish it and put same in, where defective, with a fine leather or paper stump charged with plumbago. A negative is thus often rendered serviceable which otherwise would be useless. I hope these directions will prove sufficient as far as this method is concerned; we can then study some of the other systems as practiced abroad.

[*From Photography.*]

WOODBURYTYPE FOR AMATEURS.

BY W. T. WILKINSON.

(*Continued.*)

To make the sensitive tissue, first of all polish the thin patent plates with French chalk, coat with plain collodion in the usual way, and when this has set immerse in clean cold water, until the ether and alcohol are quite washed out, this result being attained so soon as the water flows evenly, and without greasy-looking marks.

The tissue compound is composed of—

Gelatine, Nelson's No. 2 photographic	5 ounces.
Sugar	$1\frac{1}{2}$ "
Bichromate of ammonia	600 grains.
Water	12 ounces.

Place the gelatine and water in a clean jar, and allow to stand until the gelatine is quite soft, add the sugar, then put the jar into a pan of cold water, and on a gas stove gradually raise the temperature until the gelatine is dissolved, then add the bichromate in fine powder, and stir with a glass rod, add sufficient of finely ground indigo to just tint the gelatine, then churn well with an egg-beater.

Adjust the three collodionized glass plates on three leveling stands quite horizontally, then into a beaker pour four ounces of the gelatine mixture, tie over the mouth of beaker a piece of fine muslin, and pour the gelatine upon the plate, beginning in the center, do the same for the other two and allow the gelatine to set.

See that the three trays in drying-box have each a good layer of calcium chloride, then when the gelatine has set quite hard lift the plate from the leveling stand, and put it face downward in the tray, the ledges at each corner preventing the gelatine film from touching the calcium chloride As each plate is put into the tray place the tray in the box, and as the last one goes in close the box and leave it for forty-eight hours, by which time the calcium chloride will have absorbed the water from the gelatine, and have dried the film, which, after being allowed to stand in the room (dark room) for a little time, can be stripped off the glass, and it is ready for exposure to light.

The indigo should be bought ready ground up from a good maker of artists'

colors, its functions being merely to prevent the action of light from spreading laterally.

The tissue is exposed under a good transparent positive, in which is all the detail in lights and in shadow that the original negative is capable of yielding. The transparency must be bright and vigorous; if at all flat or fogged it will be useless. The outside of the picture must be masked, as if the tissue be exposed to the very edges, the process of development will be a failure. A box printing-frame should be used so as to get plenty of even pressure; the collodionized side of the tissue is placed in contact with the film of transparency. The exposure is very short, and should whenever possible be made to direct sunlight, a Johnson's actinometer being used to gauge the time, a good carbon transparency requiring on an average five tints. During the exposure to light, the printing frame should be exactly facing the sun, or the print will be likely to be out of focus.

Before exposing the tissue to light, the three zinc plates should have been polished and coated with a thin film of india-rubber, allowed to set thoroughly on leveling stands, the india-rubber solution being made by dissolving a little of the rubber solution sold in tins at mackintosh warehouses in benzole. This operation takes about twenty-four hours to effect, the solution required being about the same consistency as collodion. These plates may be coated in advance, as they take over a week to get too dry.

The tissue being exposed, and the film of India-rubber perfectly set, lay the zinc plate on the bench, India-rubber film up, take a roller squeegee in the right hand, put the edge of the exposed tissue in contact with the film of India-rubber, and then with a heavy pressure of the roller press the tissue in contact with the film of India-rubber, taking care not to allow the tissue to touch the rubber film in advance of the roller. (N. B.—The collodionized side of tissue is next the India-rubber, *i. e.*, downward.) Let the roller press the tissue into contact with the rubber film at the margins, then with a brush apply some thick India-rubber solution all round the edges, so as to prevent the water from getting underneath the tissue; let this India-rubber solution set, then sprinkle liberally with French chalk, which will absorb the last remnants of soft rubber, and place the plate into the developing tank containing clean cold water. At once light the gas underneath and raise the temperature gradually to 100 degrees Fahr., at which it must be kept for at least eighteen hours, at the end of which time the soluble gelatine not acted upon by the light will be dissolved, leaving a relief in gelatine on the zinc plate. After a rinse under the tap the plate is put on a rack to drain, and when thoroughly drained it is immersed in a dish of clean methylated spirits (free from gum), in which it is allowed to remain for an hour or two, so that the spirit can absorb the whole of the water; from here it is transferred to a drying rack, where it remains until the relief is quite dry.

The next operation will be to make a cast in fine plaster of Paris, for which purpose the plate is laid face up on a level table, the relief surrounded by strips of wood one inch high, each of the strips exactly the same height and thickness of the others.

The plaster of Paris used must be of the finest possible kind, and should be passed through a sieve of coarse muslin; pour the plaster into water, stirring vigorously, and when of the proper consistency pour over the relief, passing a long-haired stiff brush over the relief in gentle strokes, so as to prevent air-bells from forming when the plaster has been all poured; level the back with a glass plate (removing the plate before the plaster sets), and allow the cast all night in which to set.

Remove the side sticks, then lift the plaster cast gently away, and carefully examine the surface for air-bells; if any are present, another cast must be made; but if none are present put the cast on one side for an hour or two to allow the surface to get hard, then with a soft brush, dipped in fine plumbago, gently polish the surface, finishing with a clean brush, so as to be certain of removing all loose particles of plumbago.

From this plaster cast another cast is made in Spence's metal, the plaster cast being fixed inside of cast-iron box in such a manner that the metal cast is of a definite thickness, one inch being a very good size, and with perfect parallelism between the front and back. For this cast nothing is better than an ordinary typographic stereotyping casting box, the side gauges being just double the usual thickness. This cast may be made in lead, or in stereo metal; but lead or Spence's metal is best, as they give a smoother surface.

The press in which the prints from the stereo mold are made need not be of a very elaborate construction; a wooden tray 13 by 11 inches, and half an inch deep, with strips at each corner 1 inch high, to act as guides for the platen. The platen is a piece of wood 2 inches thick, made to fit inside the guides, and in the under surface of this block of wood a piece of thick plate glass is let in, about one-eighth of an inch, and cemented therein by means of a mixture of gold size and red lead; a couple of ordinary box handles on each end of top surface will complete the press, with the exception of a sheet of gutta-percha at the bottom of tray, in which to embed the stereo mold, which is done by softening the gutta-percha with hot water, putting the mold in the center and putting the platen in its place with a 7-pound weight in the center.

The ink is composed of—

Gelatine	2 ounces.
Water	13 "

The coloring matter being composed of Newman's color for carbon printing.

The precise strength of the gelatine cannot be given, as each sample of gelatine differs from another, and the proper strength can only be attained by experiment and trial.

The gelatine is soaked in the water until quite soft, then dissolved, the pigment being added and thoroughly incorporated; it is then strained through muslin, and poured into a wine bottle which is kept in a pan of warm water until required. The paper to be used may be a good sample of dull enamel chromo-litho paper, such as Dickinson's art paper.

To print, the stereo mold is fixed in the press upon the gutta-percha bottom, then rubbed over with a rag dipped in olive oil, and carefully wiped, a pool of the ink is then poured in the center of mold; a piece of paper a little larger than the mold is then placed over the pool of ink, the platen is at once put on, and the 7-pound weight on the top, and allowed to rest about five minutes, when the weight and platen are removed, and the print lifted from the mold. Now if the high lights are tinted, the pressure is not sufficient, or the ink contains too much gelatine; if the whites are clear but the picture is heavy, then the amount of pigment is too great, and must be reduced by the addition of more solution of plain gelatine.

The prints are laid away to dry, after the superfluous ink has been scraped off the edges, and which is returned to the melting pot to be used again after straining.

When the prints are dry they are soaked in a weak solution of alum, then rinsed in cold water and again dried.

The following points must be carefully observed: the sensitive tissue cannot be dried in any other way than over calcium chloride; if dried in a room it will be quite insoluble when dry, and consequently useless.

When the tissue is dry do not attempt to strip from the glass directly, but allow it to stand a short time.

Do not remove from the calcium box until an hour or two before exposure, as once the gelatine gets at all damp insolubility sets in, and cannot be checked.

The plate upon which the exposed tissue is developed must be quite flat, the plaster mold must be of sufficient thickness to preclude the chance of buckling when drying, and the stereo mold must be made carefully to keep the surface level.

The platen of the press must be flat, and the weight used must be put in the center, where possibly a lead backing to platen is advisable.

A copying press can be used as a press, in which case the tray alone, without guides, will be used with a thinner plate-glass platen to take the pressure.

A NEW EMULSION FOR PRINTING OUT PAPER.

BY PROFESSOR W. K. BURTON.

[Read before Camera Club, London.]

I REMEMBER once talking to Mr. W. B. Bolton, to whom we owe so much for our present knowledge of emulsion work, on the genesis of collodio-bromide emulsions. He told me that one of the suggestions came from Rejlander. This artist was always in trouble with his bath, or his collodion, or both, and, speaking with Mr. Bolton and some other experimentalists, he asked: "Cannot some of you clever fellows get over this eternal bother by mixing the whole lot up together?" Well, a collodion emulsion may be looked on as a mixture of the collodion and the wet plate bath. The water is the only thing that is left out, and not the whole of that.

Something of the same thing suggested itself to me some time ago in connection with printing. I had been trying various different ways of sensitizing plain paper with silver salts, trying, amongst others, some of the excellent processes of Mr. Lyonel Clark, and I got good results with many of them, if I gave the necessary amount of care and took trouble enough; but the care needed was certainly great, and the trouble of the double process of salting and sensitizing more than I liked. Moreover, I found that I was very liable to get defects in the way of spots, streaks, and the like, even after all the care and trouble. Why not, I thought, get over at least half the trouble by mixing the ingredients up together and applying them to the paper in one operation? Every formula that I had been using contained gelatine as one of the constituents, and had the making of an emulsion in it.

There is nothing new in this, it may be said. It is nothing more nor less than the gelatino-chloride emulsion that we are already acquainted with under various names, such as "aristotype" and goodness knows what else. I think, however, that the emulsions that I am going to describe have several novel features. In the first place, they are emulsions that need no washing, and that are made by the extremely simple process of pouring one liquid into or mixing one liquid with another. The emulsions are, moreover, ready for use at once, and, being liquid at ordinary temperatures, can be applied to paper or other materials either by floating, as in the common method of sensitizing albumenized paper, or by brushing them over the material that it is wished to sensitize. Farther than this, no gloss is given to the surface of the paper. I think, indeed, that, by this process, the preparation of sensitized paper—of any kind so far as surface is concerned—is reduced to the utmost possible simplicity.

I have tried a number of variations in the quantities of chemicals and have had more or less success with all. In fact, there is great elasticity in the proportions that may be used, and I believe that almost any formula for a printing out gelatino-chloride emulsion might be taken, and that good results could be got, if one or two considerations were not lost sight of. The first is that the quantity of gelatine must be kept so low that it will not cause a gloss on the paper, or cause the emulsion to set at ordinary temperatures. The second is that the formula must insure a large quantity of insoluble silver salt in suspension. The reason for this is that the coating got by an emulsion that does not gelatinize immediately after coating, is much thinner than if it does gelatinize.

To those who have not had much experience in emulsion work, it may be worthy of remark that, within very wide limits, the same quantity of an insoluble silver salt is emulsifiable in a given quantity of water, whether the quantity of gelatine used as a menstruum be great or small. Roughly speaking, the haloids, or I imagine the

other insoluble, or nearly insoluble salts of silver, resulting from the decomposition of 1 ounce of silver nitrate, can be emulsified in 10 ounces of water, but, if that quantity of silver be exceeded, a part will not emulsify, but will be thrown down in the granular form, in which it is useless for sensitizing any surface. The proportions vary, however, with certain conditions, such as alkalinity or acidity of the solutions.

The difference between the failure of a silver haloid to emulsify in a gelatinous solution, and the precipitation of it from that solution afterwards, must not be lost sight of. Thus, if any of the emulsions that I am now writing of be kept for a number of days at a highish temperature—such as that of pretty hot weather—it is likely that a good deal of the insoluble silver salt will be found at the bottom of the vessel holding the emulsion, but this silver salt is not in the granular state, and can be re-emulsified by heating the mixture to about 120 degrees Fahr., and shaking well, the more easily if a little more gelatine be added.

I select three formulas as follows:

No. 1.—A.

Nitrate of silver	400 grains.
Water	4 ounces.

B.

Gelatine (soft)	80 grains.
Chloride of ammonium	80 "
Citric acid	120 "
Water	8 ounces.

No. 2.—A.

Nitrate of silver	400 grains.
Water	4 ounces.

B.

Gelatine (soft)	80 grains.
Chloride of ammonium	80 "
Citric acid	120 "
Carbonate of soda (dry)	45 "
Water	8 ounces.

No. 3.—A.

Nitrate of silver	400 grains.
Water	4 ounces.

B.

Gelatine (soft)	80 grains.
Chloride of ammonium	80 "
Citric acid	60 "
Carbonate of soda (dry)	80 "
Water	8 ounces.

In my hands the first formula gives an emulsion suitable for preparing paper to be used for printing from dense negatives, the second from medium negatives, and the third from thin negatives.

The third formula is, I am afraid, dreadfully unorthodox. Unless I have made a mistake in my chemistry—which is highly probable—there is just about enough of ammonia chloride and of sodium citrate formed by the double decomposition of the citric acid, and of part of the soda, to decompose the whole of the nitrate of silver. I don't know whether, in this case, there will be carbonate of silver formed; but, if not, there remains a large excess of carbonate of soda. All I can say is, that the formula works all right, and that the paper that results from the use of it keeps very fairly. The paper resulting from either of the other formulas will, I have no doubt, keep as

long as any ready sensitized paper. I have already kept some nearly a month, and it is still quite white.

The following is the method of emulsifying. The two solutions are heated to a temperature of 110 to 120 degrees Fahr. The temperature should not be greater than 120 degrees, or there is a great chance that some of the insoluble silver salts produced will be thrown down in the granular form. A is then added slowly to B with much stirring. The emulsion is filtered through a double thickness of cambric, and is then immediately ready for use. If it is wished to keep the emulsion for any length of time, 10 per cent. of alcohol, in each ounce of which a few grains of thymol have been dissolved, should be added to the emulsion. It is to be observed, however, that, even with this addition, emulsion by formula No. 3 will not keep for very long.

The best way of coating is certainly by floating, allowing three to four minutes, but the quantity of emulsion needed is considerable. It is possible to get an even coating by brushing with cotton wool in the following way. The paper is laid on a sheet of glass, or a clean board, and is thoroughly and evenly damped with the solution by brushing over the surface several times in directions at right angles. It is put on one side for ten minutes or a quarter of an hour to get surface-dry, when the operation is repeated. By working in this way, it is possible to do with a very small quantity of solution emulsion, and it is possible to use what there is to the last drop, but the quantity used will be found to be more per sheet than in the case of floating. The reason, I imagine, is that it is impossible to get an absolutely even coating by brushing, and it is, therefore, necessary to make the coating so thick that there will be sufficient silver where it is at its thinnest. I have never been able to get an even enough coating by brushing only once.

The temperature of the operating-room should be not below about 70 degrees Fahr., or else the emulsion should be warmed.

The paper is best dried pretty quickly before a fire, or near a stove, after it has lain face upwards for about four or five minutes to get partly surface-dry. In fact, the paper is best treated, in the matter of drying, like paper that has been coated with the solutions for the "hot bath" platinotype process.

It will be found that it is possible to coat about eight sheets of "medium" sized paper (22 x 17, the orthodox photographic size), with the quantity of emulsion given above, by brushing, or ten to twelve sheets with a consumption of the like quantity by floating. It will thus be seen that the process is an economical one.

The color in the printing frames should be a rich brown with either of the first two formulas, a deep purple with the third.

The printing is very quick whichever of the formulas be used, but with No. 3 it is extraordinarily so. Indeed, paper coated with emulsion prepared by this formula is, I think, more sensitive than that by any other printing out process that I know of. It is so sensitive that it is quite necessary to take extra precautions in working it. It needs at least all the care that platinotype paper needs, although there is, of course, the difference that, in the case of the silver paper the result of the action of feeble light is seen at once; in the case of the platinotype paper it is not seen till the time of development. I consider it best to do everything in the way of preparation by gas or lamp light.

Toning may be either by gold or platinum. I prefer Clark's platinum process to any other. I add, however, a good dose of salt to the solution, and put the prints into it dry. That is, at least, when using either of the first two formulas. When using the third, the prints are washed in a weak solution of citric acid before they go to the toning-bath, to neutralize the alkalinity.

If a platinotype toning-bath that has been used for some time, and that has been repeatedly strengthened with chloro-platinite of potassium, be used, a color is got that some people dignify with the appellation "sepia tint," but I incline to call it a dirty brown.

I find that the emulsion is readily applicable to wood, and I hope to get good results when I have had some panels made of one or other of the beautiful white woods, with a fiber like silk, that are peculiar to this country.

I have got very fine colors of image by printing lightly and intensifying, as suggested some time ago by Clark, but have not, as yet, been able to overcome a tendency to staining in the whites. Perhaps Mr. Clark will help me with a hint or two in connection with this matter.

I send a few samples of prints done by the process, but I do not think they are fair examples of what it is capable of. They are all merely some of the results of my experiments, and are on Whatman's drawing-paper, which is not very suitable for photographic purposes unless it is specially sized, and I have not sized it. It is the only pure matt-surface paper at present procurable in this country. The prints on it look tolerable only from some little distance. I hope to have some more creditable results ready later on. There are some words of explanation in pencil on the back of each print.

[*From the Photographic News.*]

FEER'S DIAZO PRINTING PROCESS.

The primuline printing process of Messrs. Green, Cross and Bevan having excited so much attention, there is naturally a good deal of interest existing concerning the diazo process of Dr. Feer, especially as the latter is more in line with the printing processes in constant use amongst photographers, in the matter of yielding a positive print from the negative. The two diazo processes will probably find somewhat different fields of usefulness, differing as they do in important characteristics. From the following account of Feer's process, contained in the specification of the German patent, it will be seen that there is no after-development required, the print showing itself like the familiar silver print whilst still in the press, and the only subsequent treatment required is the removal by washing of the sensitive compound not affected by light.

Process for the Production of Colored Photographic Images. Patented in Germany, December 5, 1889.

The following process depends upon the fact, which the inventor has discovered, that diazosulphonic salts ($R - N = N - SO_3 Na$) with phenol alkali, and chlorides of or free aromatic amines, react under the influence of solar or of the electric light, forming an azo dyeing substance.

For carrying out the process, the inventor impregnates paper or textile fabric with a dilute molecularic mixture of a diazosulphonic salt (for instance, of aniline, amidoazobenzole, benzidine and their homologues) and phenol alkalies (for example, phenol, resorcin and β-naphthol) or chloride of or free amines (aniline, naphthylamine phenylendiamine and homologue). The paper or fabric is then dried in the dark, and exposed for about five minutes to the sun or to the electric light. Thereby is formed in the illuminated portions an *insoluble* azo dye, whilst the parts protected by the opaque portions of the negative remain in their original colorless and soluble condition. The picture is thus developed while printing. It is, after exposure, washed with water, or with very dilute hydrochloric acid, whereby the unaltered sensitive preparation is washed from those parts not affected by light, through the negative. The picture is thus fixed, and only requires drying to finish it.

The following are some examples of mixtures with which the paper or fabric is treated:

1.—Toluoldiazosulphonate of soda	25	grams.
β-Naphthol	25	"
Caustic soda	8	"
Water	1,000	"

2.—Ditolyltetrazosulphonate of soda	25	grams.
m-Phenylendiamine	8	"
Water	1,000	"

3.—Ditolyltetrazosulphonate of soda	25	grams.
Resorcin	22	"
Caustic soda	16	"
Water	1,000	"

The following examples will illustrate the application of ditolyltetrazosulphonate of soda mixed with resorcin and α, β-naphthol respectively, and phenylendiamine.

Preparation of the Solutions.

1.—Ditolyltetrazosulphonate of soda	30	grams.
Resorcin	20	"
Caustic soda	15	"

All finely powdered, are dissolved by gentle heat in one liter of water.

2.—Ditolyltetrazosulphonate of soda	30	grams.
α-Naphthol	25	"
Caustic soda	7	"

Dissolved in one liter of water.

3.—Ditolyltetrazosulphonate of soda	30	grams.
Phenylendiamine	20	"

Dissolved in one liter of water.

The solutions 1 and 2, or 2 and 3, may be mixed in equal parts.

The paper is impregnated with the above mixture, and then exposed for from ten to fifteen minutes to direct sunshine. After exposure, the picture is washed with very dilute hydrochloric acid, then with water, and finally dried.

Patent Claim.—A process for the production of colored photographic images on paper or textile fabrics, consisting of the preparation of the material with an aqueous or alcoholic solution of a diazosulphonic salt and a phenol alkali, benzene, a chloride, or free amine; dried in the dark, then covered by a negative, exposed to the influence of solar or the electric light, whereby an insoluble azo dye is formed only in the parts affected by light, the picture being thus developed; and, finally, the preparation unaffected by light is washed out with water or dilute hydrochloric acid, and the picture is thus fixed.

PHOTOGRAPHIC CHEMISTRY.

By R. Meldola, F.R.S., *Cantor Lectures at Society of Arts.*

(*Continued.*)

The haloid salts of silver will, of course, demand a considerable share of attention from the photographic chemist. The preparation and properties of these compounds should be studied in detail; their solubility in well-known reagents, such as ammonia, potassium cyanide and sodium thiosulphate, should be made the subject of practical exercises, and the chemical changes undergone can be made readily intelligible to the student whose elementary training has reached the necessary stage of efficiency. It will add to the thoroughness of the instruction if the student is made to realize that the statement that the silver haloid is soluble or insoluble in such or such a reagent is by itself inadequate; he must understand that solubility means the formation of a new compound which is more soluble than the original haloid. Thus the absorption of ammonia by silver chloride can readily be shown by putting some of the dry haloid into a tube, weighing, and then passing dry ammonia gas till there is no further increase in weight. Then, again, silver chloride may be dissolved in strong ammonia, and the solution allowed to stand till the crystals of the ammonio-silver

chloride separate. The preparation of the soluble silver sodium thiosulphate, by the method of Lenz,* is a good practical exercise, and the study of this salt will help to make clear why the silver haloids are dissolved by the thiosulphate. It is necessary to point out that by the same reagent three† distinct products may be obtained:

1. Silver thiosulphate, $Ag_2S_2O_3$, by adding a solution of sodium thiosulphate to a solution of a silver salt, keeping the latter in excess. This is a white insoluble salt, which soon darkens by the formation of the sulphide: $Ag_2S_2O_3+H_2O=Ag_2S+H_2SO_4$.

2. The insoluble double salt, $Ag_2Na_2(S_2O_3)_2$, formed by adding silver nitrate solution to a solution of sodium thiosulphate till a permanent precipitate is formed. The product is dark-colored and probably contains sulphide; it gradually becomes darker on standing owing to decomposition with the production of sulphide.

3. The soluble double salt, $Ag_2Na_4(S_2O_3)_3$, formed by the action of excess of sodium thiosulphate upon the last salt, or by adding a silver salt to a strong solution of the thiosulphate, keeping the latter in excess. In the solid condition this is a white crystalline salt, readily soluble in water, and much less prone to decompose into sulphide than the preceding salt.

All this is, of course, only ordinary chemistry, but it must be taught, and cannot be better taught than by letting the student prepare the compounds for himself and study their properties. The utility of this knowledge will become obvious when the fixing process is dealt with.

Among other properties of the silver haloids to which attention may be directed are their decompositions by various haloid acids and salts. This information cannot but be of the greatest use in practical photography. I have summarized the facts in the form of a table:

Reagent.	AgCl.	AgBr.	AgI.
Cl...	No action	AgCl formed	AgCl formed
Br...	" "	No action	AgBr formed
I ...	" "	" "	No action
HCl..	" "	AgCl formed at high temperature	AgCl formed at high temperature
HI...	AgI formed	No action	No action
KCl..	No action	" "	" "
KBr..	AgBr formed	" "	" "
KI...	AgI formed	AgI formed	" "

"No action" must be taken as meaning no decomposition.

The haloid salts of the alkaline metals and of ammonia, especially when in concentrated solutions, dissolve more or less of the silver haloid, with or without decomposition. The silver haloid is thrown out again, either in an unaltered state or transformed into another haloid by decomposition on diluting the solution with water. The solubility of the silver haloids in solutions of other salts is a feature in their chemical history which the photographic chemist will find it useful to be put in possession of. Thus these haloids are to some extent soluble, and especially the iodide, in strong solutions of silver nitrate. It must be pointed out that, in all cases where a silver haloid is dissolved by another salt, a double salt is probably formed. In fact, many

* A solution of silver nitrate is added, drop by drop, to a strong solution of sodium thiosulphate till a permanent precipitate (the insoluble double salt) just begins to appear. The solution is filtered and alcohol added till the white crystalline (soluble) double salt separates out.

† There are probably many more double thiosulphates of silver and sodium, and even this series of salts requires further investigation. Thus Mr. C. H. Bothamley informs me that by mixing 4 $AgNO_3$ with 5 $Na_2S_2O_3$ and adding alcohol, he obtained a white precipitate in which the ratio Ag : S was 1 : 1.961. The ratio calculated for $AgNaS_2O_3$ is 1 : 1.683. This salt is *soluble* and stable. By the action of 3 $Na_2S_2O_3$ on AgBr and fractional crystallization, he has isolated two crops of crystals corresponding with the formula $Ag_2S_2O_3$, 3 $Na_2S_2O_3 = Ag_2Na_6(S_2O_3)_4$.

of these double salts have been isolated, and I subjoin a list, coupled with the caution that I do not hold myself responsible for the formulas:

AgI, 2KI and AgI, KI. Bollay, *Ann. Ch. Phys.* [2], xxiv, 377.

AgCl, NH_4Cl, and AgCl, KCl. Becquerel, Gmelin's Handbook, I, 401.

AgBr, $AgNO_3$. Schnauss and Kremer, Jahresb., 1855, 419; Riche, *ibid.*, 1858, 701; Risse, *ibid.*, 1859, 229.

AgI, $2AgNO_3$. Weltzien, *Ann. Ch. Pharm.*, xcv, 127; Risse, Jahresb., 1859, 228; Stürenberg, *Arch. Pharm.* [2], cxliii, 12.

AgI, $AgNO_3$. Schnauss and Kremer, Jahresb., 1855, 429. See also Stürenberg, *Arch. Pharm.* [2], cxliii, 12.

4 AgI, $2Hg(NO_3)_2$, H_2O. Preuss, Gmelin's Handbook, vi, 199. See also Wackenroder, *ibid.*, 159 and 165; Liebig, *Ann. Ch. Pharm.*, lxxxi, 128, and Debray, *Compt. Rend.*, lxx, 995.

(*To be continued.*)

[*From Photography.*]

PHOTO-MICROGRAPHY.

BY T. CHARTERS WHITE.

PHOTOGRAPHIC delineation may be regarded from two different points of view: these are from the artistic point and the point of utility. The first case is that in which photography is employed for the purpose of producing pictures of landscape scenery modelled on the strictest canons of art, or as near to them as our limited capabilities will permit. In the second case usefulness alone comes in, apart from any consideration of art, such as in the copying of paintings, the reproduction of ancient documents and inscriptions, the recording of astronomical and meteorological phenomena, or in that branch of it which will occupy our attention for a short period this evening, viz., photo-micrography.

Photo-micrography may be considered under two heads, according as the practitioner may wish to employ low or high power objectives; whether he may be content with moderate amplification, or desire to perform feats of optical athletics in defining critical images. Under the first head he may find abundance of recreation; under the second he will find himself plunged in a maelström of worry and perplexity. But, presuming that he may be content with amplifications up to 200 diameters, I see no reason why any one possessing a microscope and a camera should not be able to practice this branch of the photographic art with satisfaction to himself and instruction to his friends. I would in all cases recommend the beginner to commence with low powers—say of about 1 inch focus, and pass up gradually to a quarter of an inch—and, after he has mastered some of those difficulties he will be sure to encounter at first, then pass on to powers of higher denomination.

In the practice of photo-micrography three things are essential, viz., a camera, a microscope and a lamp. It will be convenient if I address myself to these several points, and first let me say that cameras for this work have been devised of every possible form, but the principle is the same. The one I particularly favor, and which in my hands has given me very good results, is not a camera at all in its usually accepted sense, but is a lidless box placed on its side, and containing the microscope and lamp, these in working being shut in by a velvet curtain to exclude the light from the studio. One end of this box is open to allow the protrusion of the microscope tube. The image of the object to be photographed is projected through the microscope on to a white paper screen fixed in the carrier, which also will hold, in subsequent operations, the sensitive plate; hence it follows that, if I can focus my object on this white screen with fairly good and sharp definition, I ought to get my negative as sharp as this image on the white screen; so, you see, the principle is the same as in ordinary

enlargement. This carrier is mounted on a sliding base-board, and allows of the screen being withdrawn to the distance I think suitable for the work I have in hand. I can, by this method, cover a $7\frac{1}{2}$ x 5 plate, or, by pushing the carrier within about a foot of the microscope, reduce my image to a size suitable for lantern plates; this, therefore, gives me a great range of amplification.

There is one point about this sliding base which I might mention, as by it I am enabled to decide the number of diameters my object is magnified. Starting with the lower power I use, I place a diatom, whose known diameter is exactly $\frac{1}{100}$th of an inch, in the microscope; I project its image on to the screen at 1 foot from the microscope, and, with a pair of compasses, measure off its amplification with that power on an ordinary rule, and thus arrive at the number of diameters it is magnified. I then do the same thing at 2 feet, 3 feet, and so on. I thus register the magnifying power of that object glass at these several distances. I adopt the same procedure with all the objectives I use, and thus form a table of measurements, to which I can readily refer in all cases. This apparatus of mine is comparatively simple and inexpensive, a matter to be considered in the absence of any regular department in the State set apart for our assistance in these matters. There is another advantage in this arrangement, and that is, I can do all my work in one room, as the velvet curtain shuts in the lamp, and I can develop my negatives in the same room. But I must not take up more time in explaining this apparatus—a lantern slide to be passed through this evening will give a clear explanation of its construction. It may be necessary to say that all generally required is an ordinary bellows-camera, or, even better, a sliding camera, placed on a firm base-board of well-seasoned mahogany or teak, about 5 feet long and $1\frac{1}{2}$ inch thick, and sufficiently wider than the camera to admit of a wooden ledge on each side being fixed, to form a broad groove in which the camera can slide backwards or forwards as required, with a thumb-screw through its tail-board to clamp it at any desired distance. This base-board must be supported in such a manner that any vibrations from passing traffic, or persons moving about the house, may not be communicated to the apparatus. I accomplish this by standing it on a fairly good-sized bundle of journals placed at each end, and I find this stops the vibrations so far that very little evidence of a tremor is manifest in photographs I have taken up to 200 diameters.

I now come to that division of my subject which treats of the microscope. It is essential that this should be a steady, solid monocular, having a good, fine adjustment, for this is very necessary in getting absolutely sharp definition. Another indispensable adjunct is a substage condenser, fitted with a revolving diaphragm pierced with holes of varying diameters. In my rotating diaphragm attached to the condenser the apertures vary from $\frac{1}{16}$ of an inch, the smallest, to $\frac{1}{2}$ inch, the largest. The smallest is of no use in photographing, but it serves a very important office in enabling me to center the light. Presuming that your camera and microscope are axially centered with each other and the lamp, it does not follow that the beam traversing these must be central, and although a great deal of this eccentricity may be overcome by moving the lamp, it is not entirely overcome, but if the substage condenser has adjusting screws—which it ought to have—perfect centricity can be attained in this way: Put in a very low power, and, having turned the diaphragm to the smallest aperture, project its image in the middle of the focusing screen, and get its borders quite sharp; now rack the condenser back, and the field will be found evenly illuminated. Should the lower power be now changed for one of a higher grade, a further slight adjustment may be required, but, having already a rough approximation, this may be readily obtained. The centering of the light is a most important proceeding, for, unless this is attended to, one side of the object will have a dark and fuzzy border, while the opposite side will be light and colored, and what is thus easily perceptible in the borders extends throughout the whole object and detracts from the general sharpness of the photograph; therefore too much attention cannot be devoted to this point. The tube of the microscope

should be lined with a dead black paper, or a flare-spot from internal reflection will make itself obnoxiously evident in your negative. Some recommend black velvet as a lining; this answers very well, but, being thicker than paper, it helps to diminish the already constricted field. The tube in my microscope is trumpet-shaped, which allows the rays from the object to diverge immediately on passing through the lens, thus removing the constriction, and neutralizing any tendency to a flare-spot. I might also say that I never use the eye-piece of the microscope, as I find for my purpose I can do better without it.

(*To be continued.*)

OBITUARY.

RICHARD A. LEWIS.

Richard A. Lewis, one of the earliest photographers doing business in the City of New York, died on September 23d last, at his home in Brooklyn. He was seventy-one years old, and established a studio in Chatham Square as early as 1839. He was at one time the busiest photographer in New York City, making as many as 150 negatives a day. He made the portraits of all the noted men and women of his day, and left a stock of negatives that number over 400,000. He gave up active work about two years ago. Mr. Lewis was the inventor of a special collodion much used in wet-plate days, and he was also the originator of the glass corners for the wet-plate holders. His father before him was a manufacturer of photographic apparatus, and his two sons, William H. and Henry J., followed the business for many years.

RICHARD GARRISON BARCALOW.

We regret to note the death of another of New York's veteran photographers, R. G. Barcalow, who passed away on the morning of September 28th last. He was sixty-seven years old when he died. His work was principally in the line of commercial photography.

OUR ILLUSTRATION.

Owing to the fact that we had only a few negatives to work with, and that the preparation of the large number of prints required for the Bulletin is a matter of no small moment, we have been unable to present to our readers in an earlier issue than the present the exquisite work of Mr. C. E. Vredenburgh, made on Anthony's Climax Negative Films, and awarded the Anthony Prize at the Convention held in Washington in 1890.

We feel sure, however, that this is one of the cases where "the patient waiter is no loser," for the views are each and every one of them gems of the first water—the composition, fine rendering of details, and finish of the work throughout, placing them on a plane to be emulated by all lovers of landscape study. The extremes of light and shade, with their full detail in shadow and brilliant high lights, with all the intermediate tones, speak well, too, for the medium upon which they were made.

We are indebted to the artist for having so well interpreted nature.

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E. & H. T. ANTHONY & CO., Publishers.

THE PHOTOGRAPHIC SOCIETY OF KANSAS CITY.

A LIMITED association of amateurs has been organized in Kansas City, Mo., under the name of the Photographic Society of Kansas City. The membership has been limited to twenty-five, and although a permanent organization was only effected September 23d, nearly the whole of the required number of applications have been received. The idea of the club was conceived by half a dozen leading amateurs, who have never heretofore been identified with any of the unsuccessful attempts at organizing camera clubs in Kansas City, and the plan of procedure in this new venture was so original as to guarantee its success. Associating with them a few kindred spirits, an organization with thirteen charter members was effected, and the following officers elected: J. P. Raymond, President; W. T. Stark, Vice-President; C. H. Clarke, Secretary and Treasurer. The above-named officers also constitute an executive committee for the transaction of all business in vacation.

The society has gone to work in a business-like way. Rooms have been secured and a studio fitted up with skylights; spacious dark rooms and all accessories and apparatus necessary for practical and experimental work. The apparatus consists of several portrait cameras, ranging in size from 6½ x 8½ to 14 x 17; a number of choice lenses, an improved enlarging lantern and stereopticon combined, and in fact, as above stated, all of the apparatus necessary for successful work.

The studio will be open at all times, and each member, being provided with a key, can go and come at will and have free use of same for any work desired. Only active working amateurs who do their own work exclusively are eligible to membership.

As above stated, a number of applications has been received since the organization. The membership fee has been fixed at $10, and monthly dues at $2. The regular meetings will be held on the evening of the fourth Wednesday in each month, at which time papers, addresses, etc., upon the science of photography, will be furnished by various members.

THE BULLETIN is a great help to me and I could not get along without it.

MARIE H. KENDALL.

COMPARING the BULLETIN of to-day with that of the '60's we see that it has changed; but as it grows better it only becomes more interesting, and like a tried friend we cannot think of doing without it.

P. ERSLY.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—C. E. B. writes: In reference to Dr. Vogel's orthochromatic plates, would like to ask whether at the end of nine months the plates lose only their orthochromatic properties or become slower, or if they spoil so as to be worthless? Would also like to know if the color screens are for sale for use with this plate?

A.—We have no evidence that these plates deteriorate during one year of keeping, and we are assured by Dr. Vogel that this is his experience also. The constituents of the

plates that give them the orthochromatic character are of such a nature that there is no reason why they should not keep indefinitely when incorporated in the emulsion. The color screens are not on the market to our knowledge, but they are easily made by coating the thin cover glasses used for lantern slides with aurantia collodion, or, better yet, using the cover glasses of microscopic slides flowed with the same coloring matter and attached to the diaphragm of the lens. In any case take care to re-focus after putting in the color screen.

Q.—A. R. L. writes: In your BULLETIN you state that the ready-sensitized carbon paper is sold by some parties in New York. Will you kindly advise me who sells it?

A.—We do not know any one who sells ready-sensitized carbon paper in this country and do not remember saying so in these columns, but we presume you mean the black-print paper used in some architects' offices. This paper can be obtained of Keuffel & Esser, 127 Fulton street, New York.

Q.—A. L. P. writes: I was about ordering some acid sulphite, but a magazine article of recent date does not commend it highly. Is it liable to stain plates after thorough washing?

A.—We do not understand how any one can condemn acid sulphite. We have used this material ever since it was first introduced in this country and we have never seen a stained negative from its use. In fact, we have had a much smaller number of bad negatives when using this substance than ever before, because it will usually clear a negative that is stained in the developer if the acid sulphite is used in the fixing bath.

Views Caught with the Drop Shutter.

JOHN B. ROBERTS now has charge of the studio formerly owned by Hector Krauss, of Harrisburg, Penn.

TISDELL & SON, the makers of hand cameras, of 136 Fulton Street, New York, were burnt out in the fire that consumed the old *Commercial Advertiser* building recently. The loss is placed at $10,000.

WE regret to note that our good friend, F. W. GUERIN, of St. Louis, suffered a great loss in the destruction of his fine studio by fire on Sunday, September 27th. We sincerely hope that he was fully insured and that he will soon be again in the position to produce more of those handsome pictures for which he was noted.

THE HEYN PHOTO SUPPLY COMPANY, of Omaha, send us a handsome catalogue of the various photographic materials which they have in stock. Judging from the extensive list presented in the space of 112 quarto pages, we believe they are in a position to furnish the most complete outfits needed by the most fastidious members of the fraternity. This handsome book is well illustrated and should be in the hands of every photographer within reach of Omaha. It is filled with all the latest novelties.

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ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. OCTOBER 24, 1891. No. 20.

PARA-AMIDOPHENOL: SOME RECENT EXPERIENCE WITH IT.

SEVERAL months ago we gave an account of the advent of a new organic developer derived from carbolic acid, and called para-amidophenol. Since that time we have received many advices of its good qualities, and a number of formulas have been published that differ from those originally given. We have already spoken of the chemical nature of this new developer, and shall now confine our attention to the purely practical qualities of the substance for the photographer.

The first difficulty encountered with this para-amidophenol is its slight solubility in water. To overcome this trouble Dr. Vogel and Dr. Andresen proposed to turn the material into a hydrochloride and then dissolve it in water with the other constituents of the developer. But according to the statements of the Messrs. Lumiere in the *Moniteur de la Photographie*, in the issue just to hand, this method of procedure does not overcome the lack of solubility, because the para-amidophenol separates in the developer as soon as the potassium carbonate is added. This is due to the precipitation of the hydrochloride by the potassium carbonate used, the potassium uniting with the chlorine of the hydrochloride forming the chloride of potassium, and leaving the para-amidophenol in exactly the same condition it was in before it was made into hydrochloride. It is also stated that the chloride of potassium formed acts as a retarder in the development.

The Messrs. Lumiere tried a number of substances, liquid and solid, in order to increase the solubility of the para-amidophenol in water. Amongst those mentioned we note acetone, acetic ether, formic ether, methyl acetate and glycerine. They also tried the effect of chloral hydrate, which, although a solid substance, has the property of liquefying certain organic bodies when mixed with them (*i. e.*, camphor); but some difficulty presented itself with each of these, and they were

abandoned. After examining a number of substances as aids to the solubility of the para-amidophenol it was found that the caustic alkalies, potash, soda and lithia were the best suited to the purpose.

The quantity of alkali to be used with the para-amidophenol varies with its character. The figures given for a concentrated developer are as follows. For 20 grams of para-amidophenol take :

Caustic potash	30 grams.
" soda	25 "
" lithia	5 "

With the quantities of caustic potash or caustic soda given in these figures the developer has some very serious disadvantages. The presence of the caustic alkali makes the plates very slippery and it also dissolves the gelatine film. It is therefore very convenient to use the caustic lithia, and where the expense is of no consequence this alkali is very useful, as the quantity is small in proportion to the amount of para-amidophenol it will dissolve. The formula given by the Brothers Lumiere is as follows :

Sodium sulphite solution, 25 per cent	1,000 parts.
Para-amidophenol	20 "
Caustic lithia	5 "

This mixture is so strong that fifty-five plates could be developed in it. The amount taken was 100 cubic centimeters and the plates 9 x 12 centimeters. These figures correspond to about 4 x 5 inches for the plates and 3 ounces of the developer. The first plate was developed in thirty-five seconds and the fifty-fifth in three minutes and ten seconds. The mixture was still in working condition, but the plates had absorbed so much of it that there was not enough left to cover the fifty-sixth plate. In the whole series not a trace of fog or coloration is to be seen on the plates.

The full strength of the developer is recommended for under-exposed plates. With plates that have had a normal or over-exposure, mixing it with its own volume of water gives a strength that is a little too rapid in its action.

After reading the formulas given for the use of lithia, we thought we would try some plates exposed under the same conditions and use this new developer side by side with pyro and a mixture of eikonogen and hydroquinon. We must confess that we are delighted at the results. It is decidedly quicker than either of the older developers, and what is much more agreeable, it does not stain the hands or the plate. The solution, after some time, takes only a pale brownish color, somewhat like very weak coffee, and maintains its developing powers to a wonderful extent.

The only difficulty that we had to encounter was in the solution of the para-amidophenol in the caustic lithia. We found that the quantity given above was insufficient to take the whole of the para-amidophenol into solution in the solution of the sulphite of soda. Perhaps it would prove correct if the lithia were mixed with the para-amidophenol and then a small quantity of the sulphite solution added to the mixture. In this way the full effect of the caustic lithia would be exerted. The dissolved material could then be added to the rest of the sulphite solution. In our own case we added caustic soda to the mixture to assist the lithia in dissolving the remaining para-amidophenol.

For all practical purposes caustic soda may be used to dissolve this new developing agent. The best method to make the most of the least amount of caustic

soda is to dissolve the caustic soda in twice its weight of water, using this solution to dissolve the para-amidophenol by adding it in small quantities at a time. In this way we believe we can use much less caustic than that given in the formula above. We have also found that even with the addition of its own volume of water the developer works too rapidly and that a dilution of three or four times is a much better strength for practical use in the dark room. The new developer is certainly an advance, and in our hands is superior to anything we have yet seen. The only drawback to its use at the present time is its cost, but as is the case with all these new substances, the chemist will soon find some cheaper method of making it and then it will be as cheap as eikonogen or pyro. At the present time it is only available for experimental purposes.

EDITORIAL NOTES.

P. Ludwig recalls an old method of reducing hard negatives which has worked so well with him as to commend itself to others. The negative, after being thoroughly washed, is placed in

Bichromate of potash	1 gram.
Hydrochloric acid	3 grams.
Water	100 to 150 c.c.

After being thoroughly bleached, the negative is well washed and redeveloped in old or much diluted developer, slowly, to give the details in the shadows full development before the lights are sufficiently dense. It is then washed again and fixed in hypo as usual.

The Camera section of the Y. M. C. A. of Brooklyn is in a most healthy state, having at present more members than any other photographic organization in Brooklyn except the Academy of Photography. Their rooms are supplied with electric lights and the best of apparatus. Their President, W. H. Lowery, is an active worker, and is ably seconded by F. F. Braillard, Jr., Vice-President.

Another new aspirant for honors in the field of color photography appears in the person of Dr. Raphael Kopp, of Lucerne, Switzerland. We hope he may attain to a more successful termination of his labors than his predecessors.

We would offer our congratulations and best wishes to *The Optician* on the completion of Vol. I, and with it, the first year of its existence. It is still young, but a healthy infant, and we predict for it a long and ever-increasing career of success. Many happy returns.

The recent outing enjoyed by the united efforts of the several clubs in the neighborhood of New York, under the auspices of the Society of Amateurs, was a very pleasant and successful affair, and was indulged in by many enthusiastic members. The weather was perfect and everything tended to render it a treat long to be remembered.

The Aerial Graphoscope is the name of a new appliance originated by Mr. G. A. Bruce, of Kensington, England, and which consists of a strip of wood about 3 feet long and 2 inches wide, mounted on a pivot and painted in grada-

tions of white. This is rapidly revolved, with the result of forming the illusion of an opaque dial of white, on which the pictures may be directly thrown with the effect of appearing in mid-air.

For a new process of printing, without the use of silver salts, the following formula is given :

A.

Acetate of lead	150 grams.
Acetic acid	2½ c.c.
Water	450 "

B

Potassium iodide	150 grams.
Water	450 c.c.

C.

Salammoniac	250 grams.
Water, to make a saturated solution.	

The paper is sensitized by floating for five minutes on Bath A, and after drying, on B. An exposure of four seconds in printing frame under direct light is sufficient for most prints, but in diffused light a minute will be required. The paper should be slightly moistened over steam before printing. The image will appear green on a yellow ground. After fixing the print in solution C and washing for a half hour it is complete, and of a blue violet color.

We note that the programme of lectures before the Franklin Institute for the season of 1891-92 includes, among other well-known men, two by Mr. Henry Pettit, on Chinese and Japanese life, illustrated by photographs made by himself; one by Mr. Louis Voisson, Consul of France, illustrated by his own photographs ; and one by Mr. F. E. Ives and Mr. W. N. Jennings, on the Yellowstone Park, with photographic illustrations made with the Ives' color camera.

The Providence Art Club have decided to have a practical talk on something pertaining to photography at their future meetings, which will be given by professional men and members of the club.

A new field and opera glass, called the Collapsible, has lately been produced, which is made with a bellows like a camera, and which is capable of being folded into very small compass. We should think them a great improvement on the old style.

Mr. Victor Artigue, of Bordeaux, has invented a new method of half-tone printing by which he obtains most beautiful velvety blocks without gloss. The print is produced on a pigment, which may be applied to paper, canvass, wood or other material, and the method is said to be extremely simple and durable.

It is noticeable that the itinerant photographer of times gone by, who used to ply his trade with the assistance of his little two-wheeled cart, still exists, only that he has left his cart behind. He may still be seen on any pleasant day in the side streets, making exposures here and there, and coming round a few days later with the prints, many of which he made without orders and against the wish of

the occupants of the store in question, but which are nevertheless bought by the proprietor in nine cases out of ten, frequently netting the itinerant a very nice day's receipts.

THE Camera Club of England shows a very remarkable record of success. It starts in on the new season with a membership of nearly 750 members, with improvements in accommodations and new apparatus of large size. The club has among its accessories a lathe-room in good working order and with increased facilities for dining its members. The projected series of elementary lessons on Monday evenings is already laid out, and the result of it all is a delightful little home for its members, where all the elements of science and sociability will flourish and be appreciated.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Photographic Congresses —Stereoscopic Pictures in the Ascendancy.—Method for Making Asphaltum More Sensitive.—The Small Sizes of Modern Detective Apparatus and How to Enlarge Them.—The Expansion Method of Enlarging.

WE live at present in the period of congresses. An international congress of photographers has taken place in Brussels, but it appears as if the same had not been of a very international nature.

The *Moniteur* of September 1st writes : The congressional members present are not very numerous so far. From France, 11; from England, 4; from Belgium 11. Eleven Belgians would be a very small number when we consider that the congress is at their own door. If the fact is correct it would prove a deplorable lack of interest—Brussels, the congressional center, having alone more than a hundred photographers within its walls. Germany, Denmark, Switzerland, Servia and Russia have only one representative. It was hoped, says the *Moniteur*, that the participation upon the neutral ground of Belgium, from Germany, Austria, Russia and England, would have been a much larger one. From Italy and America nobody was present. It must be left to the judgment of the reader if such a small assembly of Belgians and Frenchmen, with a few Englishmen, could be called an international congress. From different nationalities, even among those not present, honorable presidents were chosen, partly photographic scientists like Drs. Eder and Abney; partly professional photographers like Petersen (Denmark). America was not honored. For Germany an astronomer was chosen. The formation of an international photographic society was open to discussion, and for this purpose a committee, with E. Liesegang (Dusseldorf) as chairman, was selected. The proportions of lenses, units of light and sensitiveness, and protection were also subject of conversation and debate. The ownership of a negative was admitted to the maker, who, however (corresponding with the German protectional law), can multiply the same only with the permission of the original. The propositions of the Paris Congress (1889) were generally accepted.

The statutes of the "Union Photographique Universelle" were unanimously adopted on the 30th of August. The seat of the new association is Brussels ; 17 members of the Congress as founders have paid to the general fund each 300 francs ; the yearly dues of each member are 20 francs. The officers of the

society are composed as follows: President Maes (Antwerp); General Secretaries: Goderus (Gent), Pector (Paris); Members: Liesegang (Düsseldorf), Colard (Brussels), Warnerke (London), Pricam (Genoa) and Janssen (Paris).

The congress has resolved that the first meeting of the society next year shall be in Brussels. The next international congress shall be held in Switzerland.

We were of the impression that the association was to be composed of delegates of the several photographic societies. Now it looks like the formation of a new society with yearly meetings.

If the congress—in consequence of the extremely small participation—has to show very little success, it is only due to insufficient preparation. True enough, thousands of invitations have been sent out to the smallest photographer and the last amateur. But it would have been much better to secure by previous correspondence the participation of the most prominent photographic scientists and the most popular photographic journals. Only one was present besides the editors of the Belgian journals.

Lately renewed attention is paid to stereoscopic pictures. Even stereoscopic pictures made with the detective camera are placed in the market. It is long ago since stereoscopic pictures were a favorite size. What is the reason that they went out of fashion? By oftentimes excessive plastics in many of the stereoscopic groups, the head was seemingly suspended 2 feet in front of the body.

These stereoscopic exaggerations spoiled the taste, at least in portraits; with landscapes one was less sensitive.

Portrait stereos are generally taken with double lenses, which are on the same camera, and whose centers have a distance of 72 m.m. from each other. If nearer together, the solid effect will be too weak; if further distant, it will, on the contrary, be too strong. The distance from the original is also of importance. If great, the solid effect will be weaker; if small, it will be stronger. This shows that, with lenses of short focus which have to be placed near to the subject, to produce pictures with sufficient size of figures, exaggerated stereoscopic effects as above described may easily be obtained. If subjects are to be taken stereoscopically, it should be remembered that one is accustomed to look at them generally twice or three times the distance of their height. At a similar distance the stereoscopic pictures should be taken. Loescher & Petsch used for this purpose lenses of 8 inches focus. These, at sufficient distance, furnished suitable sizes of subjects for the stereoscopic card.

Among the many pictures made by the above-named firm there is hardly one to be found which would give an exaggerated stereoscopic effect. It is remarkable that the two stereo lenses of Loescher & Petsch had an unequal focus, so that the subjects in the one picture were about 5 per cent. longer than in the other. Still they combined wonderfully in the stereoscope.

The angle of these stereos did not go beyond 35 degrees. Lately, however, wide angle lenses have been applied for stereo portraits. Here the perspective distortions at the edge combine with the solid distortions, so that such a picture under certain circumstances may be quite unbearable. But it is also important that the pictures are looked at with the proper instrument. If a picture has been taken with a lens of 8 inches focus, it should also be looked at from a distance of 8 inches, and for this purpose the lenses of the stereoscope must have approximately 8 inches focus. This rule is a great deal violated, causing a false optical effect, which reminds one of the wide angle lenses.

With regard to landscapes the distance of the lenses in the stereoscopic camera should be great, particularly if distant mountains are to be taken, so as to give the far-off objects still a plastic appearance. It doesn't matter if the distance is 3 feet. The near objects may then, of course, become too plastic. For such views no double camera is used any more, but a single one, which can be moved on a board, vertical to the visual line, and then two pictures of the same view are taken in succession in the well-known way by sliding the camera from one place to another. With regard to the visual field one is not so restricted as with portrait stereos. Angles up to 60 degrees can be taken, therefore the usual aplanat systems, or the anastigmats, which are very similar. It is to be recommended to select lenses, which nearly cover plates of 9 x 12 centimeters. I would not advise the application of lenses with a still larger visual field (more than 70 degrees).

Recently a new method has been published by E. Valenta, to increase the light sensitiveness of asphaltum. Valenta writes :

"Dr. R. Kaiser, in Nuremberg, succeeded in separating the asphaltum into three parts, one soluble in alcohol (α, resin), one in ether (β), and one in benzole and chloroform (γ), all of which contain sulphur. The resin, α, contains the smallest, and that of γ the largest quantity. The light sensitiveness of these resins increases with the quantity of sulphur.

"The latter peculiarity led me to try if it might not be possible to make the natural asphaltum more light sensitive by the influence of sulphur. The result of my tests was, that the sulphurized asphaltum showed a light sensitiveness one and a half times as strong as the preparation made by precipitating chloroform solution with ether and as the so-called Husnik asphaltum.

"To produce my light sensitive preparation 7–10 grams of sulphur are dissolved in a sufficient quantity of sulphide of carbon, to which are added 100 grams of powdered Syrian asphaltum. The solution is then liberated from the sulphide of carbon by evaporation and heated for some time in a mortar to 100 degrees C. (one hour), and mixed by continued working with the pestle, then heated slowly in an air bath until sulphureted hydrogen escapes, and then kept from five to six hours at a temperature of from 180 degrees to over 200 degrees C. Formation of burning products pointing to a decomposition of the asphaltum shows too high a temperature, and is to be avoided. The asphaltum so prepared, which has in that condition only a weak smell of sulphureted hydrogen, is kept in the dark in a well-stoppered bottle.

"For work in diffused daylight, and if particularly high sensitiveness is desired, it is to be recommended to liberate this asphaltum from the β resin and any burning products by powdering and treating the powder with ether; by shaking the same, which can be done in a wide-mouthed bottle with cork. When the ether has sufficiently acted it is poured off and the undissolved part is dried, by spreading it upon some sheets of filter paper in a thin layer.

"For use, 4 parts of sulphurized asphaltum in 100 c.c. of benzol (not benzine) are dissolved and are eventually diluted so far that the film, which forms when pouring it upon the zinc plate, will appear golden yellow. An exposure from one-half to one hour of the solution of the asphaltum in open bottle and in direct sunlight may be recommended.

"To develop the asphaltum pictures rectified oil of turpentine, free from acid, should be used. The French or Austrian turpentine is preferred. As accel-

erator of the development with great over-exposure or application of sulphurized asphaltum, an addition of so-called Hungarian or Russian oil of turpentine may be made to the before-mentioned oils, which oils applied by themselves would attack the asphaltum picture. As retarder to the development an addition of ligroin, benzine (petroleum benzine), or olive oil to the oil of turpentine may be made.

"The development is done best by simple rocking in the tray, without the aid of a cotton tuft or similar material. After the picture has been clearly developed it is washed and dried."

An increase of the light sensitiveness of the asphaltum one and a half times is not much, but still of sufficient importance for the gloomy weather of Europe.

A good deal of talk has been raised already about the plates for detective cameras becoming smaller and smaller in size. The latest arrangement of this kind, the neck-tie camera, has plates of only $1\frac{1}{2}$ centimeters square. The smallness of the many pictures made with the detective camera has brought about a desire for enlargement, which has been met by the construction of suitable enlarging apparatus with kerosene light.

The enlargements upon bromide paper, obtained with this, have one defect, a cold tone and quite frequently a certain hardness. One is so used to the gloss and tone of the albumen paper that even on enlargements its want is felt. Now, as is well known, it is not difficult to obtain enlargements upon albumen paper, namely, by enlarging the plate. The small negative is copied in the printing-frame and by lamp-light upon the same size dry plate, and a positive is thus obtained by development, which is sufficiently sharp. This small positive is enlarged in the camera to twice and three times its size, and a negative is thereby obtained which in no way is behind the original, if the latter was sufficiently sharp. The expenses connected with the enlargement are essentially restricted to the price of the dry plate of larger size, besides the original negative and a plate for the positive of it. A great convenience has hereby certainly been gained, particularly for tourists, to use a much smaller apparatus. If a size like 9 x 12 cm. is chosen, pictures will be obtained which even in the original size give a handsome print, sufficient for general purposes. The enlargements should not be made from all plates, but only the best and most interesting should be selected. A good lens is, of course, necessary for such enlargements.

Still another method of negative enlargement I would like to mention here, which is much simpler, but permits only enlargements of one-third the size. This method is already known, but has been applied very little. The glass negative is laid in fluoric acid, diluted from one hundred to one hundred and fifty times. The film can be stripped very soon and is put in water and washed thoroughly. In the water the film will stretch to one-third of its length and width; $3\frac{1}{4} \times 4\frac{1}{2}$ will then be $4\frac{1}{2} \times 6$; 5×7 will increase to $6\frac{2}{3} \times 9\frac{1}{3}$. In this manner an enlargement is obtained in the simplest way. If the method has been applied so little, the reason is only in the fear of handling the fluoric acid. True enough, this is very dangerous in concentrated condition on account of its etching properties, but diluted it is harmless.

BERLIN, October, 1891.

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

THE CHEMISTRY OF SILVER AND ITS SALTS, AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

(*Continued.*)

Silver Sulphide—Ag_2S.

Silver sulphide is the most important ore of silver. It has been found in meteorites. It occurs in amorphous masses of a lead gray color and in crystals having a metallic luster. It is ordinarily united with lead, arsenic, and sometimes with antimony. The latter ore is of a red color when pulverized, and yields when roasted pure silver and antimonic oxide.

Silver sulphide is very stable, fusible, malleable, soft, and can be scratched with the nail. In presence of organic matters and moisture it is transformed into an isomeric modification of a brownish yellow color. This change is the cause of the fading of photographic images. The picture can be revivified by treatment with gold terchloride.

Boiling hydrochloric acid transforms silver sulphide into chloride, hydrogen sulphide being given off.

Sulphuric acid converts it into sulphate with evolution of sulphur dioxide. Nitric acid attacks it slowly.

Mixed with sodium carbonate and niter it is easily reduced to metal at a bright red heat.

Iron reduces it under water in presence of sulphuric acid.

It is prepared in the laboratory by passing a current of hydrogen sulphide into a dilute solution of silver nitrate.

Argentous Oxide—Silver Tetroxide—Ag_4O. (?)

Argentous oxide is black, little soluble in water and very unstable. It is decomposed at 212 degrees Fahr., and when acted on by light into metallic silver and oxygen. The oxacids resolve it into metal and argentic oxide. Aqueous ammonia separates argentic oxide leaving metallic silver behind.

Argentous oxide was discovered by Wöhler. It is obtained by reducing silver citrate heated to 212 degrees Fahr. in a current of hydrogen to argentous citrate. This salt dissolved in water gives a brown solution, which is decomposed by boiling into argentic citrate and metallic silver, and when treated with potassa hydroxide yields a black precipitate which is the compound in question.*

Weltzien obtained argentous hydrate by placing a silver plate in a neutral solution of hydrogen dioxide. In this the plate becomes covered with a gray white coating and a bluish gray precipitate is thrown down while part of the silver dissolves. $Ag_4 + H_2O_2 = Ag_4(OH)_2$. The solution turns red brown in the air, deposits metallic silver, and when treated with potassic hydroxide gives a brown black precipitate of argentous hydrate, from which hydrochloric acid separates silver chloride and silver; thus:

$$Ag_4(OH)_2 + 2HCl = Ag_2 + 2AgCl + 2OH_2.\dagger$$

Argentous oxide is also formed by the action of hydrogen dioxide on argentic oxide, which is at first reduced, then converted by water into argentous hydrate.

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* Wöhler, *Ann. Pharm.* 30.1.

† *Comp. Rend*, vol. lxiii.

Many chemists do not admit the existence either of argentous oxide or of argentous citrate, considering them as a mixture of the argentic compound and metallic silver.

Argentic Oxide—Silver Oxide—Ag_2O.

This oxide is the best known of the compounds of silver with oxygen, dissolving in acids with formation of well defined salts. It is brown black, absorbs carbon dioxide from the air, $Ag_2O + CO_2 = Ag_2CO_3$, and acts in chemical actions as the most energetic bases, decomposing metallic salts to substitute itself for the bases.

$$Ag_2O + Cu(NO_3)_2 = 2AgNO_3 + CuO.$$

It is insoluble in the alkalies, soluble in aqueous ammonia without decomposition, and little soluble in water, to which it imparts an alkaline reaction.

All the oxidizable compounds—sulphurous acid, antimony sulphide, tannic acid, phosphorus—reduce it often with evolution of light.

Zinc, tin, copper, etc., but not iron and mercury, reduce it under water.

At a red heat it gives off oxygen, leaving behind a spongy mass of silver.

Light reduces it to metal and oxygen is evolved.

When digested for several hours with concentrated aqueous ammonia it is transformed into a black compound—Berthollet's fulminating silver—which even under water explodes if rubbed with a hard body. When dry the touch of a feather suffices.

Silver oxide is prepared by precipitating silver nitrate by potassium hydrate.

Silver Dioxide—Silver Peroxide—Ag_2O_2. (?)

Silver dioxide is the black substance deposited at the positive pole by the electrolysis of silver nitrate.

It is insoluble in water. Heat decomposes it at 400 degrees Fahr. It does not unite either with the hydracids or the oxacids, which decompose it, forming argentic salts.

Aqueous ammonia reduces it to monoxide.

Mixed with sulphur or phosphorus it explodes by shock.

Silver dioxide has not been obtained pure. Its constitution is not well-known, being, according to Fisher, Ag_4O_2.

Silver Nitrate—$AgNO_3$.

Silver nitrate is prepared by dissolving pure silver or the coin copper alloy in 2 parts of nitric acid diluted with 1 part of water.

In the first case it suffices to dissolve the silver at a low temperature, to evaporate to dryness and then fuse the residue for a few minutes, in order to burn the organic matters, by increasing the temperature. The nitrate is then dissolved in pure water, the solution acidified with nitric acid, filtered and finally evaporated to a crystallizing point.

In the second case the solution necessarily contains copper nitrate, and when the whole is in a state of fusion the effervescence which then takes place with evolution of red fumes indicates the reduction of the copper nitrate to cupric oxide; when red fumes are no more given off and the solution of a small quantity of substance in water does not turn blue by addition of aqueous ammonia—which shows that all the copper nitrate is decomposed—the residue

is allowed to cool and then dissolved in pure water, proceeding as above explained. However, as in this operation, silver nitrite, which colors the solution yellow, is formed from the reduction of a certain quantity of silver nitrate, care should be taken to convert the nitrite into nitrate by strongly acidifying the solution with nitric acid before crystallizing.

Silver nitrate crystallizes in square colorless crystals without water of crystallization. It dissolves in its own weight of water at 60 degrees Fahr., producing cold, and in all proportions in water at 212 degrees Fahr. Alcohol dissolves at 60 degrees Fahr., $\frac{10}{100}$ part of it, and $\frac{25}{100}$ part at the boiling temperature.

It is stable in the air and not reduced by light either in crystals or in solution in pure water. It oxidizes and destroys organic matter even in the dark, albumen, for example; and if these matters are dissolved, forming a colorless, aqueous liquid, they are precipitated by insolation.

Dry silver nitrate absorbs 23.07 per cent. of ammonia gas, forming a compound, represented thus: $AgNO_3,3NH_3$. This compound is not stable. It gives off ammonia at a low temperature.

Treated with aqueous ammonia in slight excess silver nitrate combines with ammonia forming a compound termed ammonia-nitrate of silver, which crystallizes in colorless prisms. It contains 16.66 per cent. of ammonia, $AgNO_3$, $2NH_3$. It is decomposed by the soluble chlorides, bromides, iodides, etc., with evolution of ammonia.

In the light it deposits silver oxide; if organic matters are present the silver is reduced very rapidly.

Silver nitrate is reduced by phosphorus and the oxidizable metals, zinc, copper, etc. If a few globules of mercury be placed in a dilute solution of the salt, the metal is deposited, forming a beautiful arborescence, termed Arbor Dianæ (the tree of Diana), from the name given to silver by the alchemists. In this action a silver amalgam is formed.

The silver nitrate of commerce is sometimes adulterated with niter. This fraud is detected by precipitating its solution in distilled water by hydrochloric acid, and evaporating the filtrate, which should leave no residue.

(*To be continued.*)

[*From Photographisches Archiv.*]

THE INFLUENCE OF MOISTURE UPON VARNISHED PLATES.

BY DR. A. MIETHE.

It is a well-known fact that a formation takes place sometimes upon varnished plates which might best be compared with a kind of crystallization in the varnish coating. The smooth surface seems in this case to be covered with mostly round, sometimes polygonal and closely united spots, showing a silky appearance when the light strikes them, and giving the impression of being funnel-shaped cavities. The whole appearance imparts a striking similarity to the crystals which are obtained if certain easily crystallizable salt solutions crystallize upon an even surface by gradual drying. Experience has proven that in the formation of these figures moisture plays a part, and one is not able to produce at any time the same appearance upon varnished gelatine plates if covered

with a moist coating of clay, or if water is sprinkled upon the same. They appear oftentimes apparently by themselves, if the plates are kept in places not completely dry, or if they are moved from one room to another of different temperature. When looked at against the light another appearance will show itself; spots are then visible only very faintly as brown, somewhat dark parts, but will print as light parts.

Stimulated by a question of a professional about the nature of these spots and the means of removing them, I have made a number of experiments offering some interesting matter.

They are as follows:

The investigation of the spots under a weak enlargement confirmed fully the supposition that crystallization had taken place here; in polarized light the affected parts showed a weak but distinct double refraction, so that suspicion was justified about the secretion of a crystalline body which forms on the varnish under the influence of moisture. Sylvinic acid for instance could be suspected as a cause of their origin.

If this was the case, the appearances had to appear in every resinous varnish coating at sufficiently extended moistening. I submitted therefore several varnish coatings, spread upon different supports, to the influence of moisture. The result was the following:

First.—Negative varnish of *K*, upon gelatine plate; spot formation after about three-quarters of an hour.

Second.—Shellac varnish upon gelatine plate; spot formation after ten minutes.

Third.—Negative varnish upon collodion; no influence after forty-eight hours.

Fourth.—Negative varnish upon plate glass; no influence after twenty-four hours.

Fifth.—Japan varnish upon gelatine plates; spot formation after several hours.

Sixth.—Japan varnish upon chloride of silver collodion diapositive; no influence after twenty-four hours.

Seventh.—Japan varnish upon a tanned pigment picture; spot formation after twenty-four hours.

Eighth.—Negative varnish upon a hard tanned gelatine plate; spot formation after twenty-four hours.

The result of these experiments is quite unexpected, as can be seen. It cannot be united with the hypothesis of crystal formation.

In the first place spots would also show in japan varnish, in which the formation of a crystallized hydrated body is not to be thought of, and secondly, it was shown that the spots are determined by the pressure of a gelatine support, and that the time necessary for the formation of spots by the influence of water depends evidently upon the glue coating being tanned or not. It showed, besides, that if the plates, in moist condition, are brushed with a stiff hair brush, at the places where the spots are, no crystalline structure will be present after drying, but that the varnish coating was simply wiped off.

But how does the appearance take place, and how is the double refraction, and the seemingly regular star-shaped figure of the spots showing distinctly on the japan varnish, to be explained?

What has gelatine to do with this appearance and why does it not form upon collodion films?

These questions find a very simple solution.

If the spots are examined by reflected light under a microscope, it will be seen at once that no crystallization has taken place here. Concentric curves will be recognized at once, grouped around a center, approaching each other closely. Each of these curves is formed of a small varnish stripe, which, of different width with different kinds of varnish, does not adhere flat to the film, but appears to be raised toward the center. The whole has the appearance of steps, and the several varnish stripes look like the shingles on a roof. The origin of this structure I explain simply as follows, having observed its formation under the microscope: Through some pore, as found in any varnish coating, the moisture penetrates to the gelatine; the gelatine swells at this point, raises the neighboring varnish coating, and breaks it after its limit of elasticity has been exhausted, so that towards the pore an elevated varnish ring will form. More moisture will penetrate through the break, a new concentric varnish ring forms, etc., until the well-known figure is formed. By the joining of several centers polygonal figures will appear, the same as a quantity of soap bubbles that together assume polyhedric forms. If the varnish coating or gelatine film has accidently been scratched, the appearance will follow the scratches, and star shaped, or figures like an ivy leaf, will appear. The weak, double refraction is easily explained by the straining under which the varnish scales are, the same as a piece of glass will become doubly refractive under the conditions of pressure or expansion. The reason that collodion plates are not influenced in the same way is simply explained, because the collodion coating will not swell in water to any extent.

A correct explanation of the origin of these spots would thus be satisfactory to science, but for practical purposes little is gained by simply recognizing the evil, and we have to ask ourselves the following questions: How are the spots to be avoided, and how can they be removed?

They are avoided simply by protecting the plate against moisture; but as this cannot be done oftentimes in a satisfactory manner, a thorough tanning of all plates is recommended. Well-tanned plates resist moisture much better than untanned ones. The application of japan varnish might also be advisable.

The removal of the spots offers great difficulties in many cases. Particularly upon evenly toned surfaces I had no success in the beginning; but the following will give relief sometimes: The plates are freed from the old varnish, placed in water for six hours, wiped with a moist tuft of cotton, dried quickly upon the rack, and re-coated with a thin varnish.

If the spots should appear very dark in transmitted light, which seems to be particularly the case with thick varnish coatings, they will always be somewhat visible after newly varnishing no matter how thoroughly the former coating was removed. Mr. Gaedicke has recommended to treat the plates, after the varnish has been taken off, with alum. In some hard cases this did not help one any.

The following, I think, has a better effect: Proceed as above, remove varnish, brush the plate three to four times with a concentrated, aqueous tannin solution, adding a little alcohol; wash half an hour, and dry quickly in a warm place, and varnish again. Plates treated thus will show still a trace of the spots when looked upon, but in transmitted light they are completely free from these.

[*From Photographisches Correspondenz.*]

THE COLORATION OF MATT VARNISHES.

BY PROF. ALEX. LAINER.

THE matt varnish, which serves as an excellent means for the preparation of the negatives for retouching in almost all branches of photography, can be made denser and with more covering power to only a small degree by addition of benzole and toluol. A too-much increased addition of benzole and toluol effects no stronger condensation of the matt film, but causes flaky secretions.

A stronger covering is simply obtained by a suitable coloration of the matt varnish. I tried fuchsin, eosin, aurantia and asphaltum. Good results are obtained with aurantia.

Two hundred c.c. of matt varnish and 1 gram of aurantia (finely powdered) are left standing for several days, with repeated shaking. A pretty dark-colored matt varnish is thus obtained, which is poured off from the insoluble residue.

This matt varnish gives strongly yellow-colored films, on which the lead pencil, graphite and stump are to be applied in the ordinary way.

By dilution with uncolored mat varnish every desirable shade of the yellow film can be obtained.

This yellow matt film is not light-proof, but will remain unchanged during the ordinary printing time.

With eosin weakly red-colored films are obtained which bleach out pretty quickly. Fuchsin colors the mat varnish very handsomely red, but the matt surfaces appear almost uncolored.

A brown-colored matt varnish is obtained by dissolving about 5 grams of finely powdered asphaltum in 100 c.c. of matt varnish. The dark-brown solution when poured off can be suitably diluted with uncolored matt varnish. It has no handsome appearance, but excels by its light resistance. It is to be filtered before use.

[*From Photographisches Correspondenz.*]

THE REDUCTION OF NEGATIVES.

BY PROF. ALEX. LAINER.

REPEATED experiments have demonstrated that even the ordinary acid fixing bath gets to a high degree clearing and reducing if the negatives are left in the same from about two to even forty-eight hours, according to requirement; a moderate clearing action can even be obtained in a quarter of an hour.

Of a more powerful action are the strong acid fixing baths recommended by me, which, as I have already mentioned, are very suitable for the removal of brown silver or mercury spots, originating by printing on not completely dry silver paper and by intensifying the negatives with mercury.

Neither the fixing salts solution nor the acid sulphite solution act separately in the above sense.

The tanning action of the acid fixing bath is of excellent service, particularly during the warm season.

AN INNOCENT AMUSEMENT.—Husband: "What have you been doing all day?" Wife: "Shopping." Husband: "Oh! Only shopping. I was afraid you were buying."

[*From the Photographic News.*]

NEW DISCOVERIES IN PHOTO-ELECTRICITY.

PROFESSOR MINCHIN recently spoke of his new discoveries relating to photo-electricity laid before the Physical Society. We had the pleasure of inspecting his apparatus, and receiving from him information as to his earlier and later methods of preparing the sensitive plates.

He uses two kinds of cells. One of them consists of a glass tube three or four inches long, in which tube is some pure methyl alcohol from oil of wintergreen, covering the two plates; platinum wires, sealed into the tube by heat, pass through the glass to the plates. The smaller plate is of absolutely clean, pure tin, a quarter of an inch long, a sixteenth of an inch broad. The larger and sensitive plate is one inch long and one-eighth of an inch broad. This one also is of perfectly pure tin, for any impurity, especially any trace of copper, promotes failure in the results. The plate is first cleaned with sodic hydrate, and afterwards with dilute hydrochloric or hydrofluoric acid; then it is laid upon a horizontal arm of porcelain so bent at the other end that, on raising from below a dish containing liquid, the said liquid covers the plate. By this method the second plate, or the one which has to be covered with a sensitive film, is immersed in the following solution:

Nitric acid	3 c.c.
Nitrate of ammonia	15 grams.
Distilled water	500 c.c.

The exact nature of the surface thus given to the tin plate is not known, but from the composition of the liquid it is probable that the effect is one of oxidation of some kind. The plate is left in the liquid about four minutes, and becomes covered uniformly with a whitish deposit. The solution is then removed by lowering the dish, and the under surface of the horizontal porcelain support is dried with blotting-paper. This dried under surface is then uniformly heated with a spirit flame moved about underneath until the liquid above has evaporated; the surface of the tin plate will then present a dirty slate color. As the heating is continued, a point is reached at which a dark shadow passes over the whole surface of the plate; if the heating be now stopped, a sensitive plate is produced, but not one of the maximum sensitiveness. Upon continuing the heat, the surface will change into a perfectly white one, and the heating should be continued until the thin vapor or smoke which is given off ceases to appear, and until the smell of nitrous acid entirely disappears. Care must be taken not to melt the tin in this process, and when the treatment is complete, the plate should be plunged into methyl alcohol from pure oil of wintergreen. A fine platinum wire has first to be fixed to the top of the plate, either by means of a solder with a low melting point, or by passing the wire through a little hole at the top of the plate, and then bending the end of the wire back over the top edge; the latter plan is found to give sufficiently good contact for practical purposes. The clean, plain tin plate is sealed to the bottom of the tube by means of its platinum wire; after the methyl alcohol and the other plate are inserted, the upper part of the tube, with the wire from the second plate passing through it, is sealed by heat. All this may be done in daylight. The complete cell has to be left from two to five hours in the dark before it will exhibit its maximum powers.

In much which has just been stated, it may be noticed what a strong analogy exists between this method of preparing a sensitive plate, and one of the methods which Becquerel employed to produce a surface on a silver plate to adapt it to the taking of a photograph in natural colors.

The tin plate thus rendered sensitive, and mounted in a cell as described, when exposed to good diffused daylight, will exert an electromotive force—E. M. F. in electricians' language—of half a volt or more, as exhibited by means of the quadrant electrometer, and it will yield a steady stream of electricity for three or four hours, after which the E. M. F. falls off.

Supposing an exposure not to have been too long, the cell will gradually recover itself in the dark; if it be not exposed for more than ten minutes or so at a time, it will recover itself in the dark; one of the cells which has been used only in the latter manner has been so employed by Professor Minchin for four years.

According to the dynamic hypothesis of the invisible photographic image, the phenomena just stated may be explained on the principle that the shorter exposures do not result in the decomposition of the molecule, which decomposition the longer exposures effect.

Some of these cells are found to be "impulsion cells," that is to say, that they do not act until the support of the apparatus is tapped—a slight touch with a lucifer match is enough. The working of small frictional electrical machines will give an impulsion from a distance. If the alcohol in the cell be changed four or five times, the necessity for impulsion disappears.

More recently Professor Minchin has been working with selenium sensitive films. The plates are sealed in very thin little glass tubes, one-eighth of an inch in diameter, and about four inches long. At the lower end is a plate of pure aluminium, cleaned by scraping. The plate above it, but not touching it, is of pure aluminium coated with a thin layer of selenium. Platinum leading wires pass through the sealed ends of the tube to the plates. The liquid used in this cell is pure acetone.

To prepare the sensitive plate, the zigzag porcelain arm already mentioned has the aluminium plate held by a forceps upon its horizontal projecting end, and the arm and plate are heated from below by means of a Bunsen flame. A melted blob of selenium is placed upon a hot glass rod, and while one hand holds one end of the plate by means of the forceps, the other hand, by means of the rod, smears the selenium over the plate in one uniform, black, viscous layer; at the same instant the gas flame is removed, and the aluminium plate taken rapidly off the porcelain arm, and waved rapidly three or four times in the air; then it is placed upon a comparatively cool part of the flat porcelain arm to anneal it, and any tendency to remelt is checked by blowing over the plate.

Next, the gas flame is worked uniformly under the porcelain arm bearing the plate. The selenium surface will then exhibit a series of changes: first of all, the black surface becomes slatey white, and, as the heating and blowing are continued, the slatey white will turn to a gray, which may be of several shades. Should it be a light gray marked by any glossy streaks or spots, the plate is to be rejected as not one of maximum sensitiveness; the melting and smearing process then has to be repeated all through until the surface finally obtained is uniform, and half way between a gray and a brown in color, but decidedly brownish. Hitherto it has not been supposed that this is the color for the most sensitive selenium.

The cell made with the two plates just described acts with great rapidity when exposed to light, and the E. M. F. disappears almost instantly when the cell is screened; but this quickness of action does not characterize the cell some days after it has been formed, although its sensitiveness is unimpaired. These selenium cells do not permanently deteriorate by any amount of continuous exposure to daylight, so far as is yet known; they have been made only about six months; they recover their powers always during the night.

Their maximum sensitiveness is in the yellow, but the whole of the rays of the spectrum give results not much inferior. The E. M. F. they yield under the action of good diffused daylight is from one-half to two-thirds of a volt. They will stand any amount of exposure to light while in open circuit, as when their E. M. F. is tested by means of the quadrant electrometer; but if the two wires from the cell be joined up so as to complete the circuit, the cell will then somewhat slowly deteriorate under the continuous action of daylight. Professor Minchin has joined up a battery of fifty of these cells, and with ordinary diffused daylight it gives an E. M. F. of twenty-five volts. One end of a strong local battery may be connected with the movable part of the

NEGATIVE BY W. H. LOWERY.

"HOW DEAR TO MY HEART ARE THE SCENES OF MY CHILDHOOD,
WHEN FOND RECOLLECTION PRESENTS THEM TO VIEW."

electrometer, so the circuit shall be completed when the part is deflected. By means of this relay, the strong current resulting from the effects of the weak one may be made to do practical work, such as the ringing of electrical bells, or the automatic turning up of the gas when the daylight grows weak.

A favorite remark of Professor Tyndall is, that discoveries in one branch of science often throw light upon problems connected with another branch of science. These discoveries in photo-electricity, and the discoveries of Mr. Croft in relation to breath images, seem to give the power of attacking the mystery of the nature of the invisible photographic image from fresh standpoints.

[*From Journal of the Photographic Society of India.*]

SATURATED SOLUTIONS AND THE USE OF ARGENTOMETER.

By THE HON. L. M. ST. CLAIR, A.M.I.C.E., *Khatmandoo, Nepal.*

As several of the chemicals used in photography keep better in saturated than in dilute solutions, and as there are several advantages in so keeping them, among others, the avoidance of constantly weighing out small quantities and the probable contamination of fingers, etc., I have been led from time to time to make experiments as to the specific gravity of various strengths of solution as tested by an argentometer, the only instrument for this purpose that the photographer is likely to possess. The results I place at the disposal of my brother photographers.

Hyposulphite of Soda.—It is a great convenience to keep this salt in saturated solution. I keep mine in a jar with a glass top at the bottom and keep a muslin bag full of crystals suspended from the neck; but other methods of accomplishing the same thing will readily suggest themselves.

As fixing solution formulas are generally given as so many ounces of hypo added to a pint (20 ounces) of water, I have adopted this plan for hypo and also for alum. Any strength of solution can be readily made in a few seconds by diluting the saturated one.

1	ounce avoir.	of hypo	to	1 pint	water reads	18	on the	argentometer.
2	"	"	"	"	"	30	"	"
3	"	"	"	"	"	44	"	"
4	"	"	"	"	"	53	"	"
5	"	"	"	"	"	62	"	"
6	"	"	"	"	"	74	"	"
7	"	"	"	"	"	92	"	"

Alum.—Common white potash alum.

1	ounce to the	pint reads	18	on the	argentometer.
2	"	"	33	"	"

This last is a saturated solution at 72 degrees Fahr.

Sulphite of Sodium.—The percentages for this and the following salts are true ones, that is, 1 ounce of a 10 per cent. solution contains 48 grains, or 100 c.c. contain 10 grams.

A 10	per cent.	solution	of sodium	reads..............	28 on the	argentometer.
A 20	"	"	"	"	52 "	"
A 30	"	"	"	"	77 "	"
A 40	"	"	"	"	100 "	"

Sodium Carbonate.—The following figures give the percentages in solution of the chemically pure crystal. I have adopted this as the standard in preference to the anhydrous salt, as it is the one most frequently specified in formulas. Should, however, a 10 per cent. solution of the anhydrous salt be required dilute to a 20 per cent.,

or more accurately a 22.2 per cent. solution of the crystal form, 20 per cent. is near enough, and should read 45 on the argentometer.

A 10 per cent. solution reads			25 on the argentometer.		
A 12½	"	"	"	29	"	"
A 15	"	"	"	35	"	"
A 20	"	"	"	45	"	"
A 25	"	"	"	55	"	"
A 30	"	"	"	62	"	"
A 40	"	"	"	84	"	"

Saturated at 72 degrees Fahr. about 110 (by estimation as the instrument is not graduated beyond 100).

Carbonate of Potassium.—The percentages are those of the chemically pure dry granular form as usually specified in formulas.

The crystal form varying so in strength, owing to aborbed moisture, that no two samples are strictly comparable.

A 10 per cent. solution reads				45 on the argentometer.		
A 12½	"	"	"	60	"	"
A 15	"	"	"	70	"	"
A 20	"	"	"	89	"	"
A 25	"	"	"	105	"	"
A 30	"	"	"	112	"	"

Eikonogen.—Professor Burton's plan of keeping this as a saturated solution in a 10 per cent. solution of sulphite of sodium is a very handy and excellent one. Any strength of solution can be readily made by remembering that the saturated solution (at and above 72 degrees Fahr.) contains 16 grains eikonogen and 48 grains sulphite in each ounce. If in doubt as to the extent to which the stock solution has been diluted the following readings of the argentometer will settle the matter:

Grains in 1 Ounce.

Eikonogen	16	12	10	8	6	5	4
Sulphite	48	36	30	24	18	15	12
Readings on the argentometer	39	29	25	21	17	14	10

The other salts that are usually kept and also used as saturated solutions are proto sulphate of iron, oxalate of potash, ferridcyanide of potash, bichloride of mercury, etc; pyro, ammonia, bromides and citrates are best kept and used as 10 per cent. solutions.

[*From Photography.*]

PHOTOMICROGRAPHY.

BY T. CHARTERS WHITE.

(*Continued.*)

While we are discussing the microscopic division of this subject, I would especially recommend that the lamp should be kept burning for some quarter of an hour or so before attempting to photograph, to allow of all the constituent parts of the apparatus to warm up and expand. The necessity for this is easily demonstrated by focusing your object as sharp as possible, and let everything remain undisturbed for about ten minutes. When looking at your object again you will find all sharpness has disappeared, and nothing but a blurred, indistinct mass is evident; but let expansion once take place, and no alteration of focus will take place the rest of the evening. I may

add that in working with powers less than 1 inch focus, a great advantage will be derived from interposing a piece of ground glass between the bull's-eye lens of the lamp and the substage condenser, its ground surface being placed next to the object. This, while it makes the light a trifle less powerful and slightly prolongs the exposure, gives a soft, diffused light by its acting as a radiant.

The plan I have always adopted for obtaining a sharp image on the sensitive plate is one that I may recommend straight-away, and thus save you the trouble of trying the various expedients suggested by many practitioners, but without satisfactory results in my hands. I say, remove the ordinary ground glass focusing screen from your camera, and replace it by a plain glass having some fine lines drawn across it with a writing diamond, these lines being placed next the objective. Now set your focusing glass till these lines are sharply defined. These lines will closely approximate to the plane of your emulsion on the sensitive plate, and, therefore, if you get the details of your object into focus with the lines on the focusing screen, the probability will be in favor of a sharp image on the negative.

The lamp I employ is an ordinary microscope lamp, burning Strange's crystal oil in which some camphor is dissolved to increase the whiteness of the light. A plano-convex bull's-eye lens is attached to it. Much discussion has taken place with reference to the position of this lens, some saying that the plane side should be next to the light, others advocating the reverse. I have tried very carefully the results to be obtained in both positions, and I cannot detect any difference in them; but, if anything, I prefer the flat side away from the lamp and next to the condenser. I don't pretend to any knowledge of the laws of optics, and I only speak from my experience.

Having got these three constituent elements—camera, microscope, and lamp—as accurately centered as it is possible, and the apparatus warmed up, we may proceed to operate; and here the question of exposure crops up and the difficulty begins. Exposures vary in proportion to the magnifying power of the objective used and the color of the object to be photographed. Although exposure tables, as in landscape photography, may offer the tyro a rough guide, giving some kind of idea to help at first, yet nothing but a cultivated judgment founded on experience can be of any permanent service. I know of no table which assisted me more than that framed by Mr. Walmsley, of Philadelphia, and for which I have in my heart often thanked him and which I append to these rather voluminous notes:

When using—

$1\frac{1}{2}$ inch objective		3–45	seconds.
$\frac{2}{3}$ "	"	7–90	"
$\frac{4}{10}$ "	"	$\frac{1}{2}$–3	minutes.
$\frac{1}{5}$ "	"	2– 7	"
$\frac{1}{10}$ "	"	4–10	"

These times may be regarded as approximate, but to be controlled by the nature, color and general character of the subject, and which nothing but experience can furnish the right cue. I have left out much that might be considered desirable to touch on; but my great desire has been to render myself more extensively serviceable to my fellow-men, and, in the hope that there may be some present this evening who may feel inclined to extend their researches in the direction of photo-micrography, I have been tempted to lay the subject before them in its barest simplicity.

THE BULLETIN is one of the best items in my business.

W. G. MANDERVILLE, Jr.

Enclosed find draft for the BULLETIN for 1891. I can't very well give it up after taking it for over twenty years.

J. W. JOHNSTON.

PHOTOGRAPHIC CHEMISTRY.

By R. MELDOLA, F.R.S. *Cantor Lectures at Society of Arts.*

(*Continued.*)

A MOST useful form of table, showing the solubility of silver chloride in solutions of other chlorides is given by Hahn in Biederman's *Chemiker-Kalender*, and is here subjoined:

SOLUBILITY OF SILVER CHLORIDE IN SALT SOLUTIONS, BY H. HAHN.

Salt.	Percentage of Salt.	Temperature of Saturation.	Percentage of Ag Cl.	Percentage of Ag.	Specific gravity.	Temperature.	Grams of Ag per 1,000 c.c.
K Cl	24.95	19.6 degrees.	0.0776	0.0584	1.1774	19.6 degrees.	0.0688
Na Cl	25.96	19.6 "	0.1053	0.0793	1.2053	19.6 "	0.0956
NH_4Cl	28.45	24.5 "	0.3397	0.2551	1.0835	30.6 "	0.2764
$Ca Cl_2$	41.26	24.5 "	0.5713	0.4300	1.4612	30.6 "	0.6283
$Mg Cl_2$	36.35	24.5 "	0.5313	0.3999	1.3350	30.6 "	0.5339
$Ba Cl_2$	27.32	24.5 "	0.0570	0.0429	1.3017	30.6 "	0.0558
$Fe Cl_2$	30.70	....	0.1686	0.1269	1.4199	20 "	0.1802
$Fe Cl_3$	37.48	....	0.0058	0.0044	1.4472	21.4 "	0.0064
$Mn Cl_2$	43.85	24.5 degrees.	0.1996	0.1499	1.4851	30 "	0.2226
$Zn Cl_2$	53.34	....	0.0134	0.0101	1.6005	30 "	0.0162
$Cu Cl_2$	44.48	24.5 degrees.	0.0532	0.0399	1.5726	30 "	0.0627
$Pb Cl_2$	0.99	24.5 "	0.0000	0.0000	1.0094	30 "	0.0000

Similar tables for silver bromide and iodide would be of special value to photographic chemists.

The study of the forms of reduced silver will have prepared the way for taking into consideration the state of molecular aggregation of a substance as influencing its characters. The silver haloids should be dealt with from this point of view, both on account of the importance of bringing into prominence the factor of physical condition, and because of the possible practical bearing of the subject in connection with the preparation of sensitive emulsions. According to the mode of preparation of the haloid, such important characters as solubility, reducibility, optical absorption and color, and photographic sensitiveness are capable of being influenced. Thus the state of concentration of a solution of silver nitrate, from which the chloride is precipitated by hydrochloric acid, appears to influence the solubility of the chloride in the acid.* It is possible that this is due to the different forms of the chloride under these conditions. By dropping a solution of silver nitrate into strong hydrochloric acid, a considerable quantity of the chloride is dissolved; according to Pierre,† more than 0.5 per cent. of the weight of acid. The chloride, prepared in the ordinary way, by precipitation from silver nitrate and a soluble chloride, after being washed and dried, is certainly not soluble in hydrochloric acid to the same extent. Here, again, it is possible that precipitation in the presence of strong hydrochloric acid gives no time for the molecular condensation of $(AgCl)_x$ to $(AgCl)_{nx}$, and that the former of these aggregates is more soluble than the latter. The existence of silver chloride and bromide in several modifications was, as is well known, first established by Stas;‡ but the photo-

* Ruyssen and Varenne, *Bull. Soc. Chim.* (2) xxxvi, 5. See also Ditte, *Ann. Chim. Phys.* (5) xxii, 551.

† *Compt. Rend.*, lxxiii, 1090.

‡ *Compt. Rend.*, lxxiii, 998; *Ann. Chim. Phys.*, v, 1874; *Chem. Centr.*, 1875-81. For thermochemical confirmation, see Berthelot, *Compt. Rend.*, xciii, 870.

graphic bearing of the discovery did not become apparent till the general spread of gelatino-bromide emulsion processes led to the further study of these modifications, and especially those of the bromide, by Monckhoven, Eder, Abney and Vogel.

I have called attention to this feature in the chemical history of the silver haloids, because, in the present condition of practical photography, no student should be allowed to neglect this all-important subject. The information is not to be obtained from the ordinary text-books used by chemical teachers; and it is instructive to note how a point of comparative insignificance in general chemical training may become exalted into importance as soon as the science becomes to be applied in a special direction. Every branch of technology abounds with illustrations of this principle. How far Stas's classification of the forms of silver bromide and chloride will stand the test of further investigation is at present doubtful.* Some experimenters recognize only two modifications and others three, while Stas himself recognizes four, viz.:

1. Flocculent, white or yellow. Produced by the addition of a solution of a soluble bromide or hydrobromic acid to a solution of silver nitrate in the cold. Both solutions must be dilute (0.5 to 1 per cent.); if the silver is in excess the bromide is white; if the soluble bromide is in excess, the precipitate is yellow.

2. Pulverulent; obtained from the preceding modification by brisk agitation with water. This form is produced more rapidly in neutral than in alkaline solutions. It is described as a yellowish-white powder, which, when dry, becomes intensely yellow on heating.

3. Granular; produced by adding a very dilute boiling solution of ammonium bromide to a boiling solution of silver nitrate containing $\frac{1}{10}$ per cent. of this salt. Obtained also by the action of boiling water on the preceding modifications, the first (flocculent) giving a dull yellowish-white, and the second (pulverulent) giving a bright yellowish-white powder. By prolonged boiling with water the granular modification gradually becomes subdivided, and after several days' boiling forms a kind of milky emulsion, from which the bromide settles out very slowly. The precipitate which then subsides is pearly white, becoming intensely yellow on agitation with a strong solution of ammonium bromide.

4. Crystalline, or fused; obtained by fusing any of the other forms. This modification is never employed in photographic operations.

It might perhaps be suggested that the first form is an unstable hydrate, capable of existing only in the presence of water; but, whatever view may be taken with respect to the actual number of modifications, the broad fact that the bromide is capable of forming different molecular aggregates possessing different colors and degrees of solubility, may be regarded as highly probable. It is desirable, therefore, that the student of photographic chemistry should, at any rate, make some experiments in this direction in connection with his laboratory work.

Among other points in the chemical history of the silver haloids which are of photographic importance, the relative reducibility claims special notice. In the earlier part of his practical work the student will have obtained metallic silver from the haloids by reduction; but he must now be made to realize that this reduction is more readily effected in the case of the chloride than the bromide, and more readily in the case of the latter than with the iodide. And, first of all, in order that the true chemical significance of reduction may be made intelligible, let a simple demonstration be given, showing that by the action of reducing agents, such as ammonium pyrogallate, potassio-ferrous oxalate, etc., the halogen is actually withdrawn from the silver and is to be found in the solution by the usual tests. Then, in order to show that the chloride is more reducible than the bromide or iodide, a solution of potassio-ferrous oxalate may be diluted till it becomes just too feeble to reduce the bromide. Some of the same solution will be found to reduce the chloride readily.

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* See V. Schumann, in *Chem. News*, vol. liii, p. 97.

Adopting the usual course, and passing from test-tubes to films, sheets of paper coated with the three silver haloids may be streaked with the same solution of ferrous oxalate or ammonium pyrogallate,* when the order of reducibility will be shown by the fact that the chloride gives a darker stripe than the bromide, and the latter a darker stripe than the iodide. The importance of these facts will become obvious when, at a later stage, the subject of photographic development has to be dealt with from its chemical aspect.

(*To be continued.*)

[*From the Photographic News.*]

NOTES ON PORTRAITURE.

BY H. P. ROBINSON.

No. V.

THERE still remains something more to be said on the subject of "motive" in portraiture.

The question to be solved is whether the sitter should be represented as sitting for his portrait or doing something else. The former would be the absolute truth, and is often stiff; the latter must be the result of more or less make-believe, and may look natural. The one would be truth absolute, the other a slight falling away from that—in art—mysterious virtue. Now, here is a problem for the impressionists who insist on the whole, entire, rigorous truth. Which will they have: the truth, or something artificial so well done as to look more truthful than the truth itself? Without attempting to decide the question, I will endeavor to point out the practice of some of the great masters of portraiture. As it fortunately happens, there have just been added to the national collection, at enormous cost (£55,000), three pictures containing portraits by three painters who are recognized by all shades of artistic opinion as among the very greatest. The only subject on which all are unanimous is that Holbein, Velasquez, and Moroni are among the first half-dozen of the great portrait painters of all ages. These portraits have also the advantage of showing the contrasting styles of three separate phases of the art. An admirable and exhaustive article by Professor Colvin, accompanied by excellent engravings of the pictures, in the January number of the *Art Journal*, should be seen by all photographers. To this article I am indebted for a few extracts. In the Holbein we have an example of "the early maturity of northern art, when the grotesque strenuousness of the primitive Teutonic manner has been mellowed by the influences of the Renaissance, and a complete power of draughtsmanship has been attained with a masterly precision in rendering both the characters and forms of humanity and the appearances of natural objects in detail; but when the painter has not yet thought of attempting fully to express the relief of objects in space, nor their relations to each other as affected by the environing atmosphere. Of this phase of northern art Holbein is the chief master. It is he who best combined the accomplishments of the Italian Renaissance with the inherited energy and unsparing precision of his own school."

Looking at the picture for our present purpose—"motive"—what do we find? Two figures standing stiffly at each side of a high table, or, as it would now be termed, a "what-not." Both figures have their arms resting on the table, and both are set up to be painted, and both are "staring at the camera." Professor Colvin says that Holbein, who in decorative and ornamental design was one of the most inventive, adroit, and powerful composers that ever lived, has, in this instance, seemed to let his composition take care of itself. The figures are placed at either end of the desk with a certain *naïf* stiffness, almost recalling the pose of a photographic group. This is not

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* The addition of some sodium sulphite is advisable in order that the results may not be masked by the too rapid discoloration of the pyrogallate.

flattering to the photographic group, but the attitudes are characteristic of the artist's portraits.

The second picture is Italian, and belongs to the Venetian school. Moroni is already well represented in the gallery by several portraits. Especially distinguished are the full-length "Portrait of an Italian Nobleman," and the famous "Portrait of a Tailor." Keeping to our purpose again, we shall find that, in the new Moroni, the figure is posing for his portrait, and "staring at the camera," while he has evidently had one of those marble columns, which we have banished from photography, broken to afford him a place on which to rest his helmet. It must be admitted that Moroni varied his practice, and sometimes represented his figures in action or suspended motion. Of this, "The Tailor" is a good example. In this portrait, the man, who has been cutting cloth with a shears, is represented looking up from his occupation at the spectator.

The third picture, by Velasquez, is, perhaps, the most interesting of the three to the painter. Professor Colvin shows us how much can be said of a simple portrait. I quote a part only of his eulogy: "In the last picture of the three we have no case of piling up of details; of the patient and strenuous imitation, part by part, of nature's multiplicity, with subordination and harmony imposed, as it were, from the outside by an effort of the artist's will and craft. We have the result, triumphant and in seeming more spontaneous, of what is really a far more complicated artistic process. * * * And this is an example of Velasquez at his best. Something of the rugged, flashing power and fierce eagerness of the sitter seems to have passed into the painter's hand, and the method of execution he has chosen emphasizes and harmonizes with the character of the subject. The rude soldier-sailor in his handsome suit stands in bodily and spiritual presence before us, and seems snorting with patience to be off to the fight once more." *

For technical qualities and assured mastery of the brush this picture is amazing, but with this we have nothing to do. Our inquiry is, how did the painter allow his sitter to stand for his portrait? He stood upright against a blank gray wall, nothing more or less. The painter probably advised him not to stand too stiffly, just as a photographer may do, and painted him. Let it be noticed that in this case, also, the sitter "stares at the camera;" this time it is a scowl, and some photographers would have the presumption to say that the head was badly lighted, and there was too much top light, and the head was under-exposed.

I, of course, have not brought forward these examples for the purpose of inducing the photographer to pose his figures stiffly because great masters of painting did so. These masters were great for other qualities, the attainment of some of which is not open to the photographer; such as color, and the power (which some call a vice) to idealize their sitters; and some qualities which are within his reach—if his arm is long enough—such as expression, and the bringing out of character. The good name of photography is always suffering for the faults of its followers. It is not always the fault of the art, but of the artist, when the leading characteristics and sometimes the character of the sitter is not brought out; but it must be confessed that few have the ability to exercise this power. Rejlander had it in perfection, although we are told by a writer in the *Quarterly* (who has probably not seen) "there is little of art to be seen in the past history of photography."* I give these examples to show that great paint-

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* It is curious and amusing that some photographers who have taken up photography comparatively recently seem to know so little of the history of the art that they think, or, perhaps, only assume, that its claims as art is a new idea, and have only been seriously made (with examples?) in their own time, and by themselves. Even Mr. Davison—who is not usually a jocular writer—in his lecture at the Society of Arts, says of photography: "In regard, however, to its own direct claim to be admitted as a means of artistic expression, it has only happened with the introduction and application of these principles (naturalistic) that any serious demand to be recognized in the domain of art has been made." This apparent ignorance is another example of make-believe, for I credit the writer with more exact knowledge—to say nothing of these same principles having been renounced as unsound by their originator.

ers did not always strive after making their sitters "doing something," and looking away from the camera; that they, in fact, frankly accepted the situation, and painted the man as he was—that is, standing for his portrait.

Now let us examine the practice of one or two other portraitists. The next of my examples in order to date is Sir Peter Lely. All will acknowledge that his art was greatly inferior to that of the painters I have mentioned. He usually represented his sitters occupied with some employment—never at rest—and as often as not as somebody else. For examples, see his celebrated portraits of Charles II's beauties at Hampton Court, "Princess Mary as Diana," and many others. Here we have action enough and to spare, but it is very artificial and make-believe. Then we come to Sir Joshua Reynolds and his contemporaries, great men in English art, especially portraiture. When they posed their sitters easily, and simply painted them, using, however, their knowledge of art in the posing, they made great pictures, which are the envy and admiration of the painters of the present day, and the choicest possession of the millionaire; but when they went beyond this, and set their figures to work, the amount of action they gave them was the measure of their failure. Exception must be made in favor of such slight action and occupation as is shown in the wonderful pretrait of "Lord Heathfield with the Keys of Gibraltar," by Sir Joshua, but when it extends to the amount visible in a picture by the same great hand in "The Graces Decorating a Terminal Figure of Hymen," in which three healthy young Englishwomen are posing in affected attitudes as mythological young persons for the purpose of having their portraits painted, the dignity of "doing something" is doubtful.

So it will be seen that there are examples of great painters working in both directions, and that some have erred in the direction of common-sense, and painting a portrait as a portrait, have found stiffness; others, trying to escape the prosaic, deviating into what they thought was grace, gave their sitters a motive—and failed.

The moral of all this is, that photographers did not invent stiff attitudes or bathos; the lesson is, that when photographers take a portrait they should accept facts, and understand that their duty is to produce a presentment of the individual—this should not prevent the pose being free, easy and natural—and that when they attempt to do more they must beware of artificiality, affectation and bathos.

[*From the British Journal of Photography.*]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

Chapter XV.—Method No. II.

A method which finds considerable favor with many of our English retouchers consists of filling in or spotting, as it were, all the leading imperfections and general defects almost completely; that is to say, the pencil is worked very carefully all over the face, filling up all the transparent spots or specks, lines, and other markings, until no trace of them is left. This done, the inequalities of light and shade, also the modeling of the various features and muscles of the face, are harmonized by a system of more or less straight lines running in a downward direction. In this treatment, as often as not the lines must necessarily run across the muscles and lines of the face. Although, as I said, many really good retouchers adopt this method, and some undoubtedly good results are gained by it, I do not at all think it an advisable one to adopt as a model upon which to form a special style or method for one's own particular use.

As the reader will observe, there are some points, though few, in this method which may be considered slightly analogous to the method described in the preceding chapter. It will be easy, on examination, to see how very slight, however, is this resemblance when I say that it is only to be found in the treatment of the nose and the frontal depression.

In this method, although the lines all take a downward direction, they are very

seldom parallel, or, to be more correct, perhaps I should say equidistant. Now this must necessarily detract from the firmness of touch as well as the general quality of the work when finished. I have known retouchers, who were more than ordinarily skillful in the execution of this method of working, who made these lines so very fine that they have, under some circumstances, imparted the appearance of having been dotted. Indeed, when extremely successful, and on a negative which lends itself somewhat to this method of working, results may be produced which might easily pass as having been accomplished by a system of stippling. This, however, occurs but seldom, as few negatives will offer favorable opportunities for success; besides, the effect will be by no means so good as that produced by the bolder and more artistic treatment of the lines, and need not, therefore, demand our further attention.

It will be found advantageous, when striving for a style of one's own, to reflect well on all the various methods of working—good, bad, and indifferent; but care must be taken not to model it upon any system but the best. The knowledge of an inferior method need not make a student fall into the errors of its ways, but on the contrary, serve as a warning to keep away from them. It may seem strange that I should lay down the theory that a really good and well-defined method should not be adopted by the student, and, in fact, become the general treatment for all retouchers. This, however, will easily be understood when I say that sentiment (if I may be allowed the expression) is an all-important factor; indeed, I may say, an absolute necessity in the production of truly artistic and successful work. It is this very feeling or sentiment in the retoucher's art that makes it absolutely necessary for each artist to adopt his own particular method, that system which will produce in his mind the most harmonious and graceful results. There is, in my mind, relatively as much sentiment and appreciation required in a retoucher's treatment of a head in a negative as there is in an artist's coloring of a picture. All artists will not sketch in and color a portrait according to hard-and-fast lines, but rather be guided by their feelings as to the most favorable manner of treating their subjects. It is this same feeling that must guide the retoucher, although in a less degree, and in a much humbler work of art.

It is the possession of these artistic feelings that will show to advantage as a retoucher perfects his style of work, and according to the degree they are possessed and taken advantage of, so will the excellence of his work be valued. It is feeling alone that will preserve intellect in a head, while taste, so called, may prove sufficient to produce a passable work. It is needless to say which would take the palm in the scale of excellence.

In America all the various methods and styles seem to have their fair share of supporters. As a rule, however, the leading retouchers work rather more in a scumbling style, being bound by no very fixed rules as to the making of a stroke. Whatever taste suggests, or an imperfection requires, there he places his touch. This is most naturally a very convenient manner of working, and when the retoucher is thoroughly experienced he can carry it to a very high degree of perfection. But, mark you, one must be truly proficient to succeed in it. Of course, in this treatment it is not usual to pay any very particular attention to the direction taken by the lines of the skin or muscles; at the same time, the work will be found to take a more systematic form than that which might be described as simply scumbling. The nearest I can get to a description of the touch is by calling it a saw-tooth one. If examined with a powerful magnifying glass the shape or character of the markings will be found to closely resemble the "business side" of a saw. The touches are generally made very fine, and produce a very charming effect of stipple when printed. The student can easily see what I mean by carefully examining a few of the American portraits sent over to this country. Sarony and Mora, of New York, have sent us very many beautiful examples of retouching, and which are well worth the best attention of the intending retoucher. Of late years retouching has been carried too far, and a kind of reaction has been setting in which will, I think, effectually check this most dangerous inclination.

On the Continent of Europe there are many very excellent systems of retouching. Indeed, generally speaking, they are nearer the perfection of this art upon the Continent than they are either in this country or in America. Although widely different methods may be used in the same town, or even the same studio, by the various operators, all seem to get the desired artistic effect to a uniform degree of perfection. To this they each add their own natural artistic feelings, which instinctively guide them, each and all, to that point of excellence to which the less cultured or commercial retoucher can never hope to arrive. On the Continent excellence and artistic effect are the qualities retouchers place before themselves, and they ever struggle to attain—a reasonable time being always allowed for the production of first-class work. Here in " Merrie England " I regret to say such is not the case. I have met innumerable cases where the important point was not: " What can you do?" but " How many can you do in a day?" In other words, here it is a question of results: " Does it pay?" There the sole trouble is: " Is it really good and artistic."

This will easily account for much of the difference between the work produced here and abroad. There are men here daily producing ordinary work, who, if placed upon the same footing as their Continental confreres, would be found capable of producing results second to none. In this country we are commercial or nothing. As I before hinted, it is more a question of " How many heads has he done to-day? " than " What splendid work this man is producing! " that is likely to decide the importance and general status of a retoucher. By all this I do not wish any one to infer that we cannot hold our own, or that all we do is wrong and everything done on the Continent is perfection. On the contrary we will find on examination that large numbers of Continental negatives are manifestly much overworked, and the likeness almost, if not absolutely entirely taken away. I regret to say that even these, as a rule, please the ignorant public (I hope they will forgive me), and so the majority of the photographers continue to send forth such productions. I most sincerely wish the public would be less easily gulled by injudicious flattery, as much better works would be the result in thousands of cases where really bad ones now pass muster.

It seems to be a rather disputed point as to whom the honor of introducing the art of retouching into this country should be awarded. I believe Herr Mohr, of Frankfort-on-the-Main, however, may fairly be allowed to take the credit. He certainly took the monetary blessings attached to it, if that should prove anything. It is undoubted that a few worked it secretly before his advent, and a very good thing they made out of it. Those who thus practiced it guarded their secret as a miser would his gold. They kept it from the rest of the profession, who, in their blissful ignorance, wondered at the excellent results produced by their more fortunate, I won't say more enlightened, rivals.

If I mistake not, Mr. Williams, then of Regent street, caused not a little sensation in those days by the marvelous results he then produced. For the first time in our history of photography ladies with badly freckled faces got a presentable portrait. The result was everybody flocked to his studio to be taken. And yet how time changes all these things! The best works turned out by Mr. Williams in those days would stand but a poor chance to-day if compared with the best works of any of our leading firms.

In those days the now old-fashioned plates were in general use, and, of course, were not retouched under the same conditions as the negatives of to-day. Then we had to retouch on the collodion film, either before or after varnishing. It was then a disputed point between the various photographers as to which was the better. Color was the first agent used for retouching, but the pencil proving to be far superior in its working very soon completely altered this state of affairs. It gradually forced color out of use, until it was altogether abandoned as a medium for retouching. I believe Mr. Williams used color first for retouching his negatives, although he ultimately adopted the use of the pencil as well. However, he began by using a neutral color,

and sometimes a blue to make up the necessary density required to do away with the defects of his negatives and so produce those results which brought him in vogue.

As I am on this subject I may as well say a few words upon the system of retouching upon the old collodion plates which came into general use shortly after Herr Mohr began to teach it publicly.

The film of the old wet plate, unlike that of its tough, dry successor, was delicate, and would not in its natural state allow of a pencil being worked over it. I do not think it necessary to dwell upon its treatment with color, as it can have very little, if any, bearing upon retouching as now practiced. To impart to this delicate film the necessary power of resistance, as well as to give it a tooth in order to take the plumbago of the pencil, a medium had to be employed. This refers to working on the film before varnishing; after, the varnish itself constituted a satisfactory base, and gave a very good tooth. If you wanted, therefore, to retouch a negative before it was varnished, the most common method was to dip each plate in a weak solution of gum, which, when dry, would not only impart a firmness to the film, but also a tooth which greatly facilitated our work. Great care had always to be taken not to breathe on the film, as it was exceedingly sensitive to moisture, and the least suspicion of moisture would tend to soften the film, and, as a result, the pencil touching it would be sure to cut through it. Assuming that the plate be all right for working, the negative had to be treated in the same manner as has been laid down for the retouching of a dry plate. It is needless to say that it was a matter of impossibility to work upon these old-time plates with the same boldness and firmness of touch as may be used with impunity upon the films in general use to-day.

The pencils in general use were those of the softer grades, and the touch was light. Naturally these negatives when varnished would admit of being worked upon with much harder pencils and commensurate boldness and firmness of touch. On the gummed film a light touch was all that was necessary, for the tooth on these old-fashioned negatives gave touch as freely as would drawing paper. Sometimes, if the least moisture happened to have been absorbed by the film, the negative would come to grief in the varnishing. Indeed, this fact gave rise to the habit in this country (where we have a little moisture at times, even in summer) of generally working after varnishing instead of before. During my stay in Paris I never saw a negative retouched after varnishing, but here I have had to retouch more than ninety-nine out of every hundred on the varnished film. We used to get a fine surface for working upon on the varnish by applying a medium made up of 80 grains of gum dissolved in 1 ounce of benzole. When thoroughly dissolved and filtered, this solution had to be applied to the parts needing treatment with a piece of cotton wool. It dried quickly and by rubbing it gently with the ball of the finger a perfect surface for working upon was procured. If the work did not, for some reason or another, prove satisfactory, it could be removed by the application of a little benzole, and the work begun over again.

Another medium, to be used similarly, was composed of spirits of turpentine, 3 ounces; and cuttle-fish powder, 1 ounce. Another, turpentine, 1 ounce; gum dammar, 10 grains; and Canada balsam, 5 grains. Still another was made by dissolving 10 grains of clear resin in 1 ounce of benzole; allow to settle for a day or two before using.

I worked without any medium for years, however, on Hubbard's varnish with the greatest ease and success. It is not necessary, however, to worry much over these matters now, as they all belong to the "long, long ago," and are not likely ever to be needed in the future. Still, they must all have a certain interest for an intending retoucher.

OBITUARY.

S. J. DIXON.

As we went to press with our last issue we heard of the death of this well-known member of the Photographers' Association of America. There are few members of the association that have not seen his daring exploits and admired his athletic ability. He was drowned while swimming in Wood Lake, Moskoga, Canada, and the cause of his unfortunate end is supposed to be cramps, for he

was too fine a swimmer to allow us to admit his inability to take care of himself in the water for many hours.

As a photographer he was well-known, both in the United States and in Canada, being an active member of the associations of both countries.

The following extracts are from the *Toronto World*, in which city Mr. Dixon was well-known and widely respected :

" It is now stated that Dixon was not swimming across the lake, but simply swimming for recreation. After disporting himself near the shore, he started to swim to a point of land about three-quarters of a mile away. Two farmers who were working on a farm and who had been watching his proceedings, thought it would be wise to send a boy in a boat after him, and started the boy Tribe to follow him. The boy states that just as he was almost within reach of Dixon, the swimmer suddenly showed signs of distress. His head canted forward, burying his face in the water. The boy became paralyzed, and although he had gone with the intention of being of use to the swimmer in case of need when there was need he became powerless. Dixon drowned almost under the youth's hand. Fate had evidently fixed the spot and the hour of his end.

"Just before going to the lake to bathe he wrote three letters, two of them to his friends Sloan and Bond, and the third to his wife. The latter gave a brief account of his journey and the prospects for the hunt, recounted the beauties of the weather and of the scenery, and concluded by saying that in a couple of hours he would be in the depths of the forest. In a couple of hours he was dead.

" The large cortege left his late residence, at the corner of King and Yonge streets, at 2.30, and proceeded to Mount Pleasant Cemetery. Rev. Dr. Wild conducted the ceremonies. The pall-bearers were Messrs. Sloan, Solomon and Edwin Bond, representing the Hunt Club, and Messrs. Staunton, J. Fraser Bryce and J. G. Ramsay, representing the Photographers' Association.

" The floral tributes were magnificent. Among them were : A wreath from H. E. Simpson ; anchor and rest, Miss Gertie Dixon ; star, from Messrs. Bond, Sloan and Solomon ; wreath and star, Mrs. Pirie ; sickle, Mr. Roseyear ; pillow, from the employes ; cross, Mr. and Mrs. Charles Brown ; sickle, Bond Street Church Mission Band ; anchor, Misses Hannah and Tillie Elliott ; pillow and star, E. Staunton and J. Fraser Bryce ; wreath and star, E. Perry ; pillow, J. G. Ramsay."

S. J. Dixon came to his unfortunate end on October 2d, and his life was cut short in its prime, his warm and genial nature making his loss keenly felt by his many friends. He leaves behind a widow to mourn his loss, and to whom we offer our sincere sympathy.

OUR TWO ILLUSTRATIONS.

THE frontispiece to this issue of the BULLETIN is from the studio of that well-known favorite of the children, Mr. George G. Rockwood, of New York. For many years this artist has made a study of the characteristics of child life, and his success in this particular line of photographic work is beyond question. He seems to have an inborn faculty of catching the interest of his little subjects and making them show their best traits before the eye of the lens. We are very much pleased to be able to present to our readers the fine example of his work in the "Child Life" portrait given in this issue of the BULLETIN.

Our second illustration is a charming example of one of those quiet scenes that carry us back to our childhood's days. It was made by the energetic President of the Brooklyn Young Men's Christian Association, Mr. W. H. Lowery, and the negative is one that he may well feel proud of. As a piece of photographic work it leaves nothing to be desired and the view exhibits a strong feeling for the picturesque in landscape photography. The buildings seen in the view are a part of the old Pompton House, which is a well-known landmark at Pompton, N. J. They are said to have been in the same family for more than one hundred and fifty years.

ANTHONY'S

Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,

Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,

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E. & H. T. ANTHONY & CO., Publishers.

AMERICAN INSTITUTE.—PHOTOGRAPHIC SECTION.

NOTWITHSTANDING the threatening state of the weather there was quite a large attendance at the regular meeting of the above section, held October 6th. Mr. Henry J. Newton occupied the chair and called for order at 8.15.

After the reading of communications and the acknowledgment of journals received, A. V. Benoit demonstrated a simple method for obtaining duplicate copies of letters, circulars and the like. A sheet of parchment is coated with gelatine and stretched on a frame. Under the parchment is placed a wet felt pad. The circular is now written with an ink consisting largely of uranium nitrate, and this is laid on the gelatine. Upon removal and inking up of the surface with a printer's roller, copies can be readily obtained. Mr. Benoit showed copies in different colored inks and explained how, by using different colors for different parts of the picture, one color only to a film, an approach to a colored photograph is obtained. This is after the principle of Ives, of Philadelphia.

F. J. Harrison exhibited a Kamaret, the latest thing in hand cameras. Its automatic tally, time and instantaneous shutter, unique device for checking the winding off of the film and its general neat appearance were discussed. The filling of the Kamarat is simplicity itself, the roll of film being simply laid loose in one side, the end of the roll being attached to a roller, after passing, over rollers, around the back of the instrument. A simple alteration converts the machine from a roll holder camera to one adapted for plates.

The same gentleman also showed two exposure timers, one, the Watkins exposure meter, a small brass instrument upon which the exposure can be correctly ascertained. On this instrument four factors are considered: 1st, the actinic power of the light, estimated by the number of seconds a piece of specially prepared paper takes to darken to a standard limit; 2d, the plate; 3d, the kind of subject; 4th, the diaphragm employed. The four index fingers representing these factors having been adjusted, a fifth index points to the proper number of seconds for exposing. The other instrument shown was the Ballard Actinometer. This is a wooden tube with a hinged end carrying a piece of glass coated so as to become luminous after exposure to light. This hinged part is thrown back and exposed to full light for thirty seconds. It is then rapidly closed and the time in seconds noted that is expended in the dark center spot vanishing. Reference to a series of tables gives at once the exposure.

Several excellent pictures, made on paper manufactured by the American Aristotype Company, were passed round, and the beautiful tones and exquisite rendering of the white drapery were much admired.

The Chairman then called on Dr. L. H. Laudy, under whose guidance an electric lamp for projection purposes has been built for the section. Dr. Laudy gave an outline of the use of electricity in this line. Speaking of the arc light, he said that ten years ago that which is to-day a commodity was then a curiosity. Its first application to lantern projection by Duboscq and Foucault was attended with flickering, hissing and general irregularity. But it was essential for certain physical experiments, and inventors recognized the necessity of supplying an automatic feed lamp. The Brush lamp was one of the first and hosts followed, the object desired being the maintenance of the carbons at a certain central and absolutely fixed distance. The low tension current is used on the lamp devised by Dr. Laudy, this doing away en-

tirely with any dangerous element. Cost, twenty cents per hour as against one and a half dollars per hour, the cost of the lime-light. At the conclusion of Dr. Laudy's remarks the lantern was put in operation, and proved to be as near perfection as one could expect. Several slides and views in Central Park, by Mr. Van Brunt, were passed through and were of excellent quality. The light was absolutely steady, no hissing or flickering being observable. One of the chief points is the simplicity of working, several of the audience going through the operation of starting the lantern and succeeding perfectly, although they had never until that evening seen the lantern.

A hearty vote of thanks was accorded to Dr. Laudy for his efforts on behalf of the section. The meeting adjourned at 10 o'clock.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE regular meeting of this society was held at 113 West 38th street, on Tuesday, October 13th. *President* STEBBINS occupied the chair, and although the evening was a cold and wet one, there was quite a large audience.

The business of reading the minutes having been dispensed with, the meeting was ready for scientific business. The first item was a paper by Mr. Stebbins, being a continuation of his paper on para-amidophenol, read at the previous meeting. After a few introductory remarks he gave the following formula:

Para-amidophenol hydrochloride..	5 parts.
Soda sulphite....................	20 "
Caustic soda....................	15 "
Water...........................	1,000 "

This mixture, which he called the normal developer, was used in the following experiments:

First.—Exposed a Carbutt B plate for ten seconds at about 8 feet from a bat-wing burner and developed with the above mixture. The image flashed up immediately and was thoroughly developed in a few seconds. This proved either that the exposure was too long or the developer too concentrated.

Second.—Exposed a Carbutt B plate to the same light for five seconds and developed as before. In this case, too, the image flashed out almost as soon as the developer was poured upon it, and was fully developed in about a minute. The positive obtained was of fine quality, having a nice, soft brown color. This proves that the exposure was about right, but that the developer was much too strong for time exposures.

Third.—Diluted the developer with its own volume of water, and used this diluted solution upon another plate which had been exposed as before for five seconds. Even with this dilution the image appeared very quickly, and was thoroughly developed in about a minute and a half.

From these three tests it is evident that para-amidophenol hydrochloride is a very powerful developer, and it is probable that by diluting one part of the concentrated developer with two parts of water, a sufficiently strong developer for time exposures will result.

This compound, like pyrogallol, is very readily oxidized in alkaline solutions by the oxygen of the air, and hence I fear that it would be difficult to keep it in a solution containing caustic soda. As soon as the latter is added, the mixture turns brownish red, and after developing two or three plates the solution turns dark brown, but, unlike pyro, it does not seem to stain the fingers.

With caustic soda as an alkali, para-amidophenol hydrochloride is at least five times more powerful than eikonogen, and the negatives or positives obtained have that soft yellowish brown quality which is characteristic of pyrogallol, and which insures good printing. As it is difficult to keep the para-amidophenol hydrochloride in one solution like eikonogen or hydroquinon, I would suggest that it might be put up in two separate solutions as follows:

I.

Sulphite soda, crystals.....	20 parts.
Para-amidophenol hydrochloride..................	5 "
Water....................	500 "

II.

Sulphite of soda..........	20 parts.
Caustic soda..............	15 "
Water....................	500 "

For use mix equal parts of I and II.

For time exposures dilute the concentrated solution with one or two parts of water as required. For lack of time I have not been able to carry these experiments as far as it was originally intended, but, between now and our next meeting I intend to extend my experiments on the carbonates of sodium and potassium and will also read a paper upon the relative reducing power of para-amidophenol

chloride upon salts of silver, as compared with pyrogallol hydroquinon and eikonogen.

Mr. Dayton asked whether this substance was on the market, and was informed by the President that E. & H. T. Anthony & Co. now had it.

Dr. Ehrmann did not know whether the substance that he had used was identical in composition with that used by Mr. Stebbins, but the results as obtained by him were somewhat different. With eikonogen and hydroquinon he had often got staining; and reading of some experiments in Germany on para-amidophenol he wrote for and obtained some. Lantern slide plates exposed only one-half the time required, for eikonogen developer gave excellent results with this substance. Several such were passed round and were indeed of excellent color and beautiful transparency. Dr. Ehrmann said he had always denied the possibility of gelatine to make a process plate equal to the wet plate. There is always a certain haze in the gelatine plate. He believed that in para-amidophenol photographers had a developer with which it might be possible to attain such density and such transparency as to equal a wet plate. With regard to the half tones, the Doctor passed round prints that showed conclusively that no fault could be found with the new developer upon this score. He got better results with carbonate of potash than with the caustic alkalies. He trusted that with this developer another step might be made towards obtaining good negatives for process work on gelatine plates.

Mr. Murray thought that the cry of "That developer stains!" was too often repeated, indeed was brought to the front with the advent of every new one. He believed that the cause of staining was not due to the developer itself but to the use of old developer and prolonged immersion.

Mr. F. C. Beach had tried para-amidophenol and had found it exceedingly good for underexposed plates. He recommended the following formula:

Para-amidophenol.......	2 grains.
Sodium sulphite.........	48 "
Caustic potash.......6 to 10	"
Water.	1 ounce.

Dr. Ehrmann said he had come particularly to hear Dr. Higgins on acid fixing baths. Dr. Higgins, however, was unable to attend. Dr. Ehrmann said that he could not see how so much sulphide of silver could be formed on the plate as to stain the sensitized albumen when in contact with it to such an extent as to render the print useless. This was quite contrary to his experience with the acid fixing bath, and he could not reconcile the fact with Dr. Higgins' statement. Furthermore, the remedy suggested by the latter gentlemen he considered to be absolutely non-suitable. The remedy suggested is thorough washing in water. Now, as silver and sulphur are insoluble in water, he could not see how washing could help matters.

Mr. Stebbins could not see how either sulphur or silver sulphide could be formed. He had used the acid fixing bath for over a year without any trouble, indeed with great success.

The meeting adjourned at 10 o'clock.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—H. A. writes: Can you inform me through the correspondence column of the BULLETIN as to the cause of and remedy for the dull white stains in inclosed prints? They appear a week or more after the completion of the print. Several of my best prints have fallen victims to them lately and I cannot find any mention of them in the text books which I have.

A.—The trouble with your prints is due to imperfect fixing. If you will look carefully at the prints you will see that it is not the white parts that cause the peculiar effect that you mention, but the darkened surrounding parts that are stained by the darkening of the silver compound left in the film from the imperfect fixing. Fix your prints for a longer time or use a stronger fixing bath.

Q.—T. G. A. writes: Please tell me through the columns of the BULLETIN what is the cause of the change of color in prints when they leave the toning bath and go into the fixing bath? In my case they have a rich purple tone when they are in the toning bath, and when they get into the fixing bath they become reddish.

A.—The change of color you mention is evidently due to the weaknes of your toning bath or to want of sufficient time in the bath before going to the fixing. If you silver your own paper it may be due to want of silver in the printing bath and lack of silver on the paper. Try a little stronger bath.

Q.—H. L. writes: I have had trouble with my chloride of platinum used for toning I wish to tone positives made with the wet-plate process to give a black shade. The formula given is as follows:

Platinum chloride...	1 gram.
Water..................	1 pint.

Neutralize the chloride with sodium bicarbonate, and then add nitric acid till just acid to litmus paper. This mixture was made in three separate quantities, and instead of toning to a black the positive was made thin and of a weak whitish color. I boiled the solution thinking it was chlorine that caused the trouble, but the result was the same.

A.—Platinum chloride, as it is usually found in commerce, is not the kind to use for the toning of silver pictures. The proper thing to use is chloro-platinite of potassium. The following formula works well:

STOCK SOLUTION.

Chloroplatinite of potassium................	60 grains.
Distilled water.........	2 fluid ounces.

For toning take—

Stock solution..........	1 dram.
Nitric acid	1 or 2 drops.
Water to make........	2 fluid ounces.

In cold weather tone at a temperature of 80 or 90 degrees Fahr., using warm water.

Views Caught with the Drop Shutter.

F. W. GUERIN, the St. Louis photographer, who was burnt out recently, is again at work, but unfortunately he has lost a large number of his fine studies that can never be replaced. His loss by the fire is estimated at $6,000 to $7,000 and the insurance at $12,000.

MR. THEODORE ENDEAN, of Cleveland, met with a severe accident recently while moving some heavy accessories. A large frame fell upon him and broke his ankle.

WASHINGTON, October 6th.—Gus Thielkuhl, formerly employed in one of the Government Departments here as a photographer, shot himself late yesterday afternoon on the grave of his little son in the Prospect Cemetery. He was taken to the Garfield Hospital, where he is now dying.

WE regret to note the death of J. H. Rhodes, of Columbus, Ga. He was a photographer in that city for many years and was highly respected.

C. H. GRAVES & SONS, of Boston, the world renowned makers of Atwood's pure alcohol, have recently introduced a fine grade of alcohol for the special use of perfumers. If any of our readers need such an article, their reputation in the photographic world is a sufficient guarantee of the fine quality of the alcohols made by Messrs. Graves. Atwood's alcohol is without an equal for photographic work.

A NEW company has recently been formed in Worcester, Mass., for the purpose of manufacturing the IMPROVED PHENIX PLATES and argentic plates for positive pictures. The company has bought the plant formerly owned by the Phenix Plate Company on Mill street, and has organized under the name of The American Dry Plate Company. President, Charles A. Hill; Treasurer, Frank B. Waite. Mr. W. H. Fitton and Mr. J. W. Mock, who have been the demonstrators for the Phenix Plate Company, will be retained by the new company.

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NEGATIVE BY
CHAS. H. DAVIS.

PRINTED ON
N. P. A. EXTRA BRILLIANT PENSÉ
ALBUMEN PAPER.

Figure Study.

ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. NOVEMBER 14, 1891. NO. 21.

THE "ARISTO" PRINTING PROCESS.

SOME very severe lessons that were drawn from the advent of dry plates are still in the minds of the fraternity. Reputations and business were ruined and created by them, depending upon the enterprise of the photographer in availing himself of the advantages offered by their use, or his indifference in recognizing that any new agent could enter the field to the extent of injuring his business or standing in the profession.

While in all the walks of life we find individuals incapable of profiting by the greatest of all teachers, experience, the great majority of the fraternity have keenly kept in mind the revolution wrought by the dry plate and have watched the market carefully since, lest an equally important agent should make its appearance. This may account for "Aristo" making greater strides in one year than dry plates did in three.

About one year ago "Aristo" ready prepared paper first made its appearance on the Chicago market. Since then it has steadily advanced in favor, until to-day we find it in use generally throughout the entire west and among the most prominent members of the fraternity in that section.

To find a material thus indorsed after standing the test of a year, the eastern photographer certainly accepts a serious risk when he treats it indifferently.

"Aristo" must not be confused with the different gelatine papers that have been on the market commonly known as Aristotype. It is purely collodion, and the effects produced from it are absolutely permanent and of entirely different qualities. The finish, while very brilliant, is of a quality that pleases the art student as well as the popular taste. The finish is that produced from ivory or porcelain, and is free from the offensive tin polish produced by glacéing gelatine paper or enameling albumen. It is as pleasing to the eye of the admirer of the platinotype as to that class of picture buyers whose sole idea of merit lies in a polished surface.

The photographer who sends on for a trial package of Aristo and gives it to his printer to try carelessly on negatives he has made for albumen paper, is quite liable to be misled into throwing to one side what might have enhanced his business twofold, or what his competitor may use as a means of decreasing it to the same extent.

The man who argues to himself that a material that has come into general and prominent use must be practical and productive of superior results if properly manipulated, and then enters into a thorough study of it, will be amazed at its possibilities. He will find that he must first start with his negative; that he has a printing paper that does not require the strong contrast of light and shadow to produce definition, strength and brilliancy; that he can light broadly, use white backgrounds, even for white draperies; secure magnificent detail combined with softness, and the definition still preserved. By trying the paper on several of his negatives, gradating from what he would call by the old silver process "flat" to his most intense and contrast work, he will soon discover the qualities he needs to produce best results from "Aristo." His experience will teach him to light his subject evenly, give full time and develop with diluted developer. This will give him a negative easy to make, and increase his printing capacity twofold, with results impossible to secure by any other known printing process that is practical.

There are a few points in the mechanical manipulation of the paper that must be known to the printer before he recognizes that it is as easy to work as the old process. After he discovers how easily the curl is handled, he at once appreciates that he has escaped entirely all of the troubles arising from the eccentricities of the silver bath. Tear drops, blisters, measles are no longer known. He finds that upon arriving at the gallery he can at once proceed to print with no further trouble than to take the paper from the box and place it in the frames. He is relieved of silvering, fuming and cutting; also of racking his brain in the hopeless task of sizing up the weather. If it clouds in an hour he has no paper spoiling on his hands. If the light does not permit of getting off a full toning batch there is no need of toning until the next day, or a week for that matter. If the day breaks gloomy and the sun makes its appearance for an hour he is ready to take advantage of it. Any practical printer can learn to manipulate "Aristo" in two days by demonstration or by reading intelligently the direction sheet accompanying each package of the paper.

The toning differs very slightly from the old process. Gold and alkali is used with the same judgment necessary to good results on albumen. A perfectly pure gold and alkali must be used, as a collodion film is more sensitive to alloy in gold and impurities in alkali than albumen. A specially prepared gold and alkali is put up by the manufacturers of "Aristo" which relieves the fraternity from all difficulties in this respect and at a price that does not increase cost of toning.

The bath should be neutral and tested by both red and blue litmus paper. If neither changes color the bath is right. The same judgment should be used as to size and speed of bath as with albumen. The fixing bath is much weaker in hypo than with albumen. The mounting and burnishing is the same as the old process.

The American Aristotype Company, of Jamestown, N. Y., are the manufacturers of "Aristo," and have a large force of demonstrators on the road educa-

ting all who are inclined to the process. Demonstrations are now being made in New York and the eastern cities, and if we mistake not, there will be no thinking man in the profession that will not give "Aristo" his careful consideration.

EDITORIAL NOTES.

THE amateur clubs about the country are waking to new life as the winter season approaches, and from present indications the winter will be one of great activity among photographic organizations.

The Richmond Camera Club gave an informal exhibition of slides at the house of their President on the evening of the 3d inst., and the Capital Camera Club, of Washington, opened their season with an exhibition of pictures from the 29th to the 31st of October, both inclusive, which was much enjoyed by the many members and friends of the club, who availed themselves of the opportunity presented to view the fine collection of prints exhibited.

THE Lynn Camera Club entertained its friends at a most enjoyable lantern slide exhibition on the 27th of last month, on which occasion the views were from many well known New England subjects and a large number of European scenes as well. It is the intention of the club to give several such exhibitions during the coming winter.

WE are glad to see that these competitive exhibitions of work are indulged in by the more experienced Knights of the Camera, as well as by their younger brothers in the art, as is evidenced by the recent fine display at the St. Louis Exposition, when the leading progressive photographers of the city showed specimens of their work that elicited many warm words of praise from all who saw them. Prominent among the exhibitors were the Guerin, Strauss, Gross, Genneli, Scholten, Hammer, Parsons and Canover Studios. The displays were fully up to what would have been expected from such talent, the Scholten's being noticeable from the artistic manner in which it was shown, and Guerin, like himself, requiring much space, which was as usual well filled with choice prints. Strauss was represented by prints of all the leading medical men of the city, and headed his exhibit with the old query, "Who's your doctor?" The entire exhibit was well worthy of careful study and would have done credit to the Art Gallery of the P. A. of A.

THE New York Camera Club have arranged for two illustrated lectures in November, one to be by Frederick H. Chapin, on "Mountaineering in Colorado," on the 12th, and the other by Cornelius Van Brunt, on the 23d, the subject of which is to be "The Beaverkill Region and the Catskills."

WE note with much interest a new departure in the construction of lenses which is about being patented by that indefatigable worker, Mr. T. R. Dallmeyer, and which is intended to perform the same service that has hitherto been accomplished by the combined efforts of the telescope and camera. Mr. Dallmeyer has obtained with it a picture of a crow lighting on a tree, at a distance of 300 yards, in which the bird measures from tip to tip no less than three quarters of an inch. This will form a most important part of the photographer's equip-

ment in the future if it can be brought to such a state of perfection as to be of commercial value, as we have every reason to believe it can and will.

The New Orleans Camera Club inaugurated a very laudable enterprise on the 18th ultimo, when a large contingent started in different directions under a well organized plan, to obtain photographs of the city in its many phases, with the purpose of compiling them in the nature of a pictorial history of New Orleans. They enjoyed a delightful day and returned with many excellent views, which will form a very fine basis for this work.

It seems to us that there is an excellent opportunity for many of our neighboring clubs to emulate the example set by their New Orleans cousins.

We record with pleasure that our good friend, Mr. John E. Dumont, ot Rochester, was awarded the first gold medal for his work exhibited in the "Photography at Home" competition lately held in England under the auspices of the *Amateur Photographer*. The titles of his prints were: "Fabiola," "The Bait Question," "The Formula," "A Good Hand," and the "Dice Players." We congratulate Mr. Dumont on this recent acquisition.

Another one, well known in photography, whose efforts have done much towards its advancement, has been gathered to his fathers in the death of Dr. Josef Petzval, of Germany. Dr. Petzval was the originator of a portrait lens which bears his name, as well as the older orthoscope. His work was also largely carried into the field of telescopy and microscopy. He died in the eighty-sixth year of his life.

A new camera club is about to be formed at New Bedford, Mass. Mr. F. W. Smith is at the front in the matter, and we wish him success.

Among the winners of honors at the recent International Amateur Exhibition at Glasgow, Scotland, we notice the names of Mr. C. B. Moore, of Philadelphia, who took a prize, and Miss Catharine Weed Barnes, George H. Hastings, of Boston, and John E. Dumont, all of whom received honorable mention.

There is said to be uptown in a window a very interesting view taken with a French panoramic camera, which is complete in one negative, and which measures 10 x 35 inches. Those who have seen it, speak highly of its merits.

The Photographic Society of Philadelphia are by this time well established in their new quarters, No. 10 South 18th street, which is finely equipped with large conversation room, meeting room, photographic laboratory, dark rooms, enlarging and printing rooms.

We are in receipt, from Mr. Geo. W. Curtiss, of Kansas City, of a most exquisite view of Pike's Peak, made by himself on a recent trip. Mr. Curtiss writes that he has about sixty more equally good, in which case he is to be congratulated, as the one before us is of great beauty.

The California Camera Club have inaugurated their season's work by a very successful lantern slide exhibition, which was witnessed by a large and enthusiastic audience.

We have before us a number of prints from the studio of Edson, Bethel, Vt., which are very fine, particularly several landscapes, the technical qualities of which are remarkably good, the distance and atmospheric effect being indicative of orthochromatic plates, which we think he must have used, though we are uninformed on this point. They are extremely creditable.

An interesting series of exposures was lately made by Anschutz, of Lissa, of a dog in the act of jumping over a low bush. There are twenty-four negatives of different stages of motion, showing, as did the Muybridge negatives, the peculiar attitudes assumed at different instants of time, some of which would be considered almost, if not wholly impossible, were it not for our faith in the camera.

The Brooklyn Academy of Photography has secured an admirable suit of rooms for its headquarters, at 201 Montague street, and is about prepared to start with everything that a club needs for success. The apartments will be fitted up with all the necessary accessories for photography; the members will be supplied with lockers for their private use, and a very enjoyable and profitable winter is looked forward to. The club numbers now one hundred and forty-four members.

[*From our Special Correspondent.*]

ENGLISH NOTES.

The lantern-slide season is once more upon us, and most workers are taking stock of their season's negatives and getting out material for winter exhibitions and lectures therefrom.

Interviewing Mr. Herbert Fry (of Fry & Co., one of our principal manufacturing firms) the other day, he was good enough to give me a demonstration of a method by which lantern slides can be made to advantage by workers who are only able to practice this fascinating art after business hours are over and when the sun has taken his departure. The principle consists in the use of the lime-light. The ordinary oxyhydrogen lantern is placed facing, and two or three feet distant from, the negative to be reduced and copied; and the light from the lantern is focused as strongly as possible upon the negative. The negative itself is fixed in any of the cheap forms of reducing cameras now on the market, and the average exposure for a half-plate negative is one minute. This time is less than I should have expected; but "Fry's" lantern plates are two or three times faster than the other popular plates on the market, Thomas's and Mawson's.

For developing lantern slides nothing seems so good as hydroquinone with carbonate of soda. To get pinkish-purple tones the exposure should be greatly increased (say to seven minutes with the lime-light), and then the developer well restrained with ammonium bromide and with the addition made of ammonium carbonate. Is lantern slide making as popular in "The States" as it is over here? It ought to be, for it gives the finest and most impressive result which a negative is capable of producing. Our professionals make lantern slides from

all their "likely" portrait negatives, and a number of orders for enlargements are obtained by showing the slide upon the screen to the customer when he calls for his copies.

The Automatic Photograph Co. is dead. Their machines have proved wretched failures, as every photographer could have told the "outside public," by whom the shares were taken up. Some scores of the machines (ugly iron pillars with central glass eye) have been erected at places of popular resort, and the pennies of the British public have been dropped by thousands in the "slots;" but the resulting tintypes—at first only bad—became such fearful things that the British public (or at least a section of it) threw stones at the machines after receiving them. Then a man was appointed to look after each machine; but as the "keepers'" wages came to more than the receipts, that dodge did not prove profitable. And finally the whole affair has gone to the bad and is now in the Bankruptcy Court. Altogether, about half-a-million dollars has been wasted on this miserable abortion, to the benefit of nobody except, perhaps, certain promoters.

The following "move" has been found to pay well by professional photographers in several parts of England during the last year or two. It is widely announced that on a certain day the "pro" will photograph, free of charge, all babies who are brought to his studio, and will present the fond parents with one print. Hundreds of babies invariably turn up on the day named; most of the parents give orders for copies in addition to the one presented; the affair gets into all the local papers; and the probable result is that the photographer gets a fair remuneration and a splendid advertisement!

Mr. Stead, the versatile editor, is endeavoring to form a "National Society of Lanternists," whose business it shall be to go into our workhouses, hospitals, schools, etc., and interest and amuse by the aid of the lime-light those thousands whose opportunities of becoming acquainted with the beauties of nature are of a very limited description. With the powerful aid of such publications as his *Review of Reviews*, and *Help*, Mr. Stead is certain to do good work in this direction. Already many prominent users of the lantern have intimated their intention of affording active aid.

Is it possible to persuade plate makers to label every plate on the back with their name, the nature of the plate (most makers make plates of more than one speed or class) and the date of production? Such information would be of the greatest service to the users of the said plates. How often it happens that if our dark slides have been filled and then not used immediately, we forget the precise nature of their contents. The labels should, of course, be on orange or on black paper. On such labels a small space could be left for a number to be pencilled in by the user when filling the dark slides, and by which each particular plate could be identified when it came to be developed. Such labels would also provide a ready means by which exposed and stored-away plates could be distinguished from unexposed plates. The number or a pencilled cross would indicate that they had been exposed. Any plate maker who will carry out this idea will find his reward.

The *Camera Club Journal* for October contains *inter alia* a further instalment of Jerome Harrison's "Literature of Photography." It includes an account of the contents of a weekly paper—*Notes and Queries*—which took photography under its wing in the days when as yet the photographic press was not. From

1854 to 1860 *Notes and Queries* contained almost weekly contributions from the lights of those days, Dr. Diamond, F. S. Archer (the inventor of the collodion process), and many others. No photo library is complete without the early volumes of this interesting periodical, which now restricts itself mainly to items of antiquarian lore.

And what a fund of information about the early history of photography in the United States must lie buried in the files of the daily, weekly and monthly papers and journals published between 1839 and (say) 1860! When some one writes the history of the introduction of the "black art" into America—and it has never been half or even quarter done yet—there will be a rich harvest to be reaped (but only after long and laborious study) in the direction I have indicated.

The important photographic exhibition at Glasgow, just concluded, has proved a thorough success. There were 268 exhibitors, and out of the sixty medals awarded nine have gone to foreigners. America seems not to have been represented. The exhibition of the year—that held in Pall Mall by the Photographic Society of Great Britain—has just opened, and I will give my impressions of it in my next letter. It is worthy of note that evening lantern shows have proved the most telling and financially advantageous adjuncts of recent exhibitions. But the slides have not merely been "put on the screen;" they have been shown by their producers, and have formed only a part of a definite and connected story—a first-class lecture, in fact—delivered each evening by first one and then another of the able men who now add photography to their studies in other directions. For our science gathers to its bosom the best workers from all the sister sciences. It places a new power in their hands, and they, grateful, do it honor in return. Astronomers, chemists, geologists, archæologists, botanists, physicists, architects, engineers, artists—unite in the cry of "May photography flourish," and—"the same to you, sirs," replies

Talbot Archer.

EXHIBITION OF PHOTOGRAPHS AT THE AMERICAN INSTITUTE.

For several years the Bulletin has urged the authorities of the American Institute to put a little more energy into the photographic part of their exhibition. This year we are very much gratified in seeing this suggestion carried out. In addition to the space usually allotted to the photographic exhibits in the main hall the whole of the upper part of the building on Third avenue is devoted to an exhibition of the pictures of the Society of Amateur Photographers of New York. That this move on the part of the management is appreciated by the visitors can be readily seen by any one visiting the gallery and noting the number of persons viewing the exhibits and the interesting comments that fall from their lips. One remarks: "This is a great improvement over the empty spaces of last year." Another says: "I wonder why they never had this before; these pictures are very pretty and interesting." While yet a third remarks: "I think these old New York houses are well worth seeing, and it is a good idea somebody has taken the trouble to photograph them." Such comments that we heard made by spectators during two visits to the exhibition, and the number of such spectators, lead us to believe that this new move for photography will prove the beginning

of a series of annual exhibitions worthy of the art and a credit to the American Institute. We only regret that so few of the members of the photographic section of the Institute have taken part in the exhibition. We believe but three out of the fifty exhibits are by members of the section.

Those of our readers who are interested in the progress of photography and are wise enough to take lessons from all sources will find this year much food for thought in the photographic exhibit of the American Institute. Not that they will see everything to please them, but they will see much from which they can learn what not to do, and yet more from which they will learn how to excel.

Beginning with the exhibits of the professional photographers in the main hall, the first and most novel is that of Frank E. Pearsall, of Brooklyn. In this exhibit we noted a decided improvement in the production of photographic pictures. The first impression of the display is its unusually artistic appearance. This effect is due to several novel changes in mounting the prints and also in the character of the prints themselves. The mounts have wide margins and are of rough surface ; while the prints have all the appearance of platinotypes, although we were not sure of this latter. They may be printed on plain salted paper, but at all events they have all the appearance of platinum. The light was so uncertain we could not determine this point. As an exhibit it was unusually original, the ragged edges of the prints and the rough surface of the mounts giving an appearance to the pictures that was quite refreshing in photographic work. The soft tones of the prints with their matt surface was also uncommonly effective from an artistic point of view. Altogether we must give Mr. Pearsall the palm for his novel ideas in the production of these pictures, which he calls "Knarfographs."

Dana, of New York, as usual, had a fine display of his well-known and wonderfully artistic work. The beauty of his pictures is found in the exquisite taste displayed in the use of accessories. In most cases these are dispensed with, and the eye rests on the model and feels its effect without any distractions. Some of Mr. Dana's studies are gems of artistic thought, as, for example, his figure of the French peasant girl in sabots with her basket held above her head and hand to mouth shouting her wares. The picture is teeming with life, and is worthy of the highest praise. We also noted some gems of tinted work in this same exhibit, plaques and a fan, and several small heads with blue, peacock and gold backgrounds, all giving unusually fine effects.

The Cramer Co. also had a fine exhibit of the work done on their plates. Here again we noted effects worthy of the closest study by all. Landscapes, groups, large heads, and various small sizes of portraits, all showed great beauty in the production of the negatives.

Wilhelm, of New York, had an exhibit of enlargements which in some cases were quite good. The cabinet pictures of the same exhibit were also of good quality.

Fredricks, as usual, had a fine display of enlargements in pastel. His cabinet work was also very good. But the pictures that caught our eye were a frame of platinum prints which we understand he is now making at a slightly higher cost over ordinary silver prints. We are glad that this style of print is coming to the fore, and that Mr. Fredricks has taken up this line of work. When the value of these pictures becomes known, together with their great permanence, those who wish to preserve portraits will have none other.

Tanquerey, of New York, had a display of very good cabinet and other small pictures; we also noted some good enlargements.

De Young exhibited some plain enlargements that were quite good, but the colored pictures were not as good in our estimation.

Robinson, who advertises "twelve imperials for ninety-nine cents," showed some work that was by no means poor when we consider the price he gets for his labor. Some of his large work was very good and worthy of good compensation. His chief fault to our minds is the inartistic use of accessories and backgrounds.

Rockwood, of New York, had a fine exhibit of enlargements made entirely from amateur negatives. This work was done by the electric light, and we must confess it has a quality that is highly pleasing, while it reveals a manner in which the professional photographer can greatly aid the amateur. We have never seen amateur enlargements of like size that were anyway near as well done as these. They give a new value to small negatives.

Passing now from the main exhibition hall to the gallery up-stairs, the first exhibit to attract our attention is that of McMichael, of Buffalo. As usual the studies of this artist are worthy of close attention. Some pictures made on India mounts were novel and effective as small portraits. The studies must be seen to be appreciated.

Roesch Bros., of St. Louis, had a fine frame of studies full of life and excellent examples of the best photographic work. Many of these pictures are copyrighted owing to their artistic value.

Kuebler also had a number of beautiful studies that are worthy of more than a passing glance. We only regret that our space compels us to pass them with so few words.

An uncommonly fine view of "El Salta de Juanacatlan, Mexico," by W. H. Jackson, of Denver, gives a very good idea of the wonderful landscape work of this artist. His views are probably without rivals in the world.

Ranger & Cornell exhibit some fine work in the form of large life-size heads.

This part of the exhibition is not ticketed as clearly as it might be, and we may have overlooked some exhibits or wrongly named some others. But there is such an improvement in this section of the American Institute Fair that we most strongly urge our readers to see the photographic work displayed, and thus encourage the managers of the Institute to make yet better efforts.

We now come to the exhibits of the Society of American Photographers of New York. Here we have a decided innovation on the part of the management of the Institute. About fifty separate exhibits cover the walls of the gallery. These are displayed in about three hundred frames, the number of individual pictures being many times this amount. In fact this part of the exhibition alone is well worth several visits to the fair.

As we have a good many notes on this part of the exhibition, and our space is already exhausted, we can now only earnestly recommend our readers to visit the Fair, and we promise them an interesting and instructive time. In the next issue we shall give our impressions of the amateur display.

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

THE CHEMISTRY OF SILVER AND ITS SALTS, AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

(*Continued.*)

SILVER THIOSULPHATE—$Ag_2S_2O_3$.

(*Formerly Silver Hyposulphite.*)

WHEN equivalents of silver nitrate and sodium thiosulphate in aqueous solutions are mixed a precipitate is thrown down, which is the silver salt in question.

Silver thiosulphate is unstable ; it splits up as soon as formed into silver sulphide and sulphuric acid:

$$Ag_2S_2O_3 + H_2O = Ag_2S + H_2SO_4.$$

It unites with sodium thiosulphate, forming a double compound $Ag_2S_2O_3$, $2Na_2S_2O_3$, unalterable in the light, but having in presence of moisture a great tendency to decompose. It is obtained by dissolving a haloid salt of silver, the chloride generally, in a small excess of sodium thiosulphate and precipitating with alcohol. It dissolves in water, in aqueous ammonia, and possesses a sweet, then disagreeable, metallic taste.

Another double salt is known containing but one molecule of sodium thiosulphate, $Ag_2S_2O_3$, $Na_2S_2O_3$, little soluble in water, unalterable when dry, but rapidly decomposed in the moist state. It is formed when a haloid silver salt is dissolved in excess in a solution of sodium thiosulphate.

Such is the instability of silver thiosulphate that as it forms it turns brown in the light before dissolving in the sodic salt. To it is due to a great measure the fading of silver photographs, the sulphuric acid formed by its decomposition acting on the sodic salt with it combined, or mechanically retained in the paper, and liberating sulphurous acid and sulphur, which latter converts into sulphide the silver constituting the photographic image.

TRISILVER PHOSPHATE—Ag_3PO_4.

(*Silver Phosphate.*)

Silver phosphate is prepared by the action of an alkaline phosphate on silver nitrate. It is yellow, easily reduced by light, soluble in aqueous ammonia, in ammonium carbonate, phosphoric acid, potassium cyanide and sodium thiosulphate.

It is decomposed by sulphuric, nitric and acetic acids.

It was first used in photography by Dr. Fyfe.* Maxwell Lyte devised a printing out process based on its reduction by light. The image is toned in a solution of gold terchloride in sodium phosphate and fixed by phosphoric acid.†

SILVER CARBONATE—Ag_2CO_3.

Silver carbonate is obtained by double decomposition. It is slightly soluble in water, very soluble in aqueous ammonia, potassium cyanide and sodium thiosulphate. All the acids decompose it, the action giving rise to a violent effervesence from liberation of carbon dioxide. It is reduced by light.

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* R. Hunt, *loc. cit.* † Bull, *Soc. Franc. Phot.*, 1856, and "Journal London Photographic Society," 1857.

Reactions of Silver Salts.

Potassa, soda and ammonia produce in silver solutions a brown precipitate of silver oxide soluble in aqueous ammonia.

The alkaline carbonates produce a white precipitate soluble in aqueous ammonia. Ammonium carbonate produces a white precipitate soluble in excess. Potassium iodide produces a pale yellow precipitate soluble in excess, very little soluble in aqueous ammonia.

Potassium ferrocyanate produces a white precipitate, turning blue in the light, not decomposed by hydrochloric acid, and soluble in aqueous ammonia.

Potassium ferricyanate produces an orange precipitate.

Potassium chromate produces a rich brown precipitate.

Hydrochloric acid and the soluble chlorides produce a white precipitate of silver chloride, even in exceedingly dilute solution. The precipitate is not acted on by nitric acid; very soluble in aqueous ammonia, and instantly turning slate-blue, then gray, etc., in the light. The lead and mercury salts besides are the only ones forming a white precipitate with hydrochloric acid and the alkaline chlorides; but as lead chloride is soluble in boiling water and the mercurous salt is blackened by aqueous ammonia, they can be easily detected.

Stannous chloride produces a precipitate of silver chloride, which is reduced by excess. Ferrous sulphate precipitates the silver as metal.

Hydrogen sulphide produces a black precipitate of silver sulphide.

A bar of zinc placed in silver solutions precipitates metallic silver.

Organic Silver Salts.

Silver acetate is prepared by adding a solution of sodium acetate to a solution of silver nitrate It crystallizes in white needles scarcely soluble in cold water, and rapidly blackening by exposure to light.

Silver Chloracetates.—The mono-salt is soluble in water. It is reduced by light. The dichloracetate possesses similar properties. The trichloracetate is little soluble, and easily reducible under the luminous action. The monochloracetic acid can be advantageously employed instead of acetic acid to acidify the collodion silver bath for half-tone pictures.

Silver benzoate is obtained by adding silver nitrate to a hot solution of sodium benzoate. No precipitate is formed, but in cooling the silver salt deposits in colorless needles which turn brown by reduction in the light. It is employed in photography, being derived from the green benzoin used in some preparations to print on paper, on wood, silk and canvas.

Silver lactate is decomposed at 212° F., and rapidly blackens by exposure to light, yielding by the printing-out process very good photographic images.

Silver malate behaves in a similar manner to the lactate both under the action of heat and light.

Silver succinate is white, scarcely soluble in water, soluble in ammonia and altered by light. It is employed in photography.

Silver tartrate is formed when mixing silver nitrate and Rochelle salt solutions. If prepared in the cold it precipitates as a white amorphous substance, but if both solutions are hot, the solution in cooling deposits it in brilliant spangles which are very little soluble in water and to some extent soluble in aqueous ammonia. The latter solution heated to the boiling temperature is decomposed and the silver reduced to metal.

Silver tartrate is reduced in the light. Heat decomposes it into pyrotartric acid, carbon dioxide and metallic silver. It is employed in photography to prepare gelatine emulsions for the printing out process (aristotype).

Argentous citrate. This salt was obtained by Wöhler in heating argentic citrate to 212° in a current of hydrogen. The product partly dissolves in water which it colors red. By boiling the solution shows blue and green reflections and deposits metallic silver, being decolorized. It is quite unstable and rapidly reduced by light.

The constitution of argentous citrate is not known with certainty and its existence as a definite compound is not proven.

Argentic citrate is white, little soluble in water. Exposed to the influence of light it turns red in being reduced. It is not very sensitive. It is, however, employed with other silver salts in the printing-out and other photo processes.

Silver resinate. When a solution of rosin in potassium hydrate, or aqueous ammonia, is added little by little to a concentrated solution of silver nitrate, a precipitate is thrown down, consisting of two silver salts formed by the abiatic and pinic acids, which are the constituents of colophony or common rosin. This double silver salt, silver resinate, is insoluble in water, soluble in turpentine, benzole, etc., and very sensitive to light, which renders it insoluble in its solvents. It may be employed to etch on glass plates in operating as with bitumen.

Besides the silver organic salts above described there are about fifty others which are more or less rapidly acted on by light; amongst the more sensitive we will cite the valerianate, the glycosine, the mono, di and trichloromethylsulphites, the saccharate, quinate, formobenzoilate, cuminate, lithofellate, seleniocyanide, rutate, nitrohippurate, benzoglycollate, glycyrrhizinate and the albuminate. The two latter are employed in photography.

[*From Deutsche Photographen Zeitung.*]

THE YELLOW COLORATION OF GELATINE-NEGATIVES AND MEANS TO REMEDY THE SAME.

BY G. MERCATOR.

The gelatine dry plates of the present day are, as is well known, subject to all kinds of accidental mishaps, from the moment of exposure to the varnishing of the finished negative, which may easily become a source of fault-finding and evil. Such a casualty now causes quite frequently the very disagreeable and obnoxious yellow coloring of the negative. Every practical photographer knows that such yellow spots are either obstructive to quick printing or are of similar effect to fog. The well-known sentence, that it is mostly easier to prevent an evil than to look for the remedy, may in general be applied here. But to do both successfully, it is necessary to learn the causes of a yellow coloration, to determine, guided by theory and practice, a suitable remedy for each separate case. Attention should in first line be paid to the developer.

It is well known that the pyro-developer in various compositions will easily become intensely brown when exposed to the air. This brown coloration quickly takes place by addition of ammonia. According to the duration of development the negative will assume a green yellow, and yellow to brownish fog, which destroys the clearness of the shadows completely. If the plate was of somewhat short exposure, the reduced silver shows even that peculiar coloration,

while the shadows appear thus oftentimes comparatively clear. Hydroquinone is likewise of a brown coloring action to many plates, particularly when concentrated and applied several times. To prevent the coloration in both cases, the greatest cleanliness is the first condition. But pyro should then be applied only with potash or soda, and the developed plate should be well washed under a strong stream of water. To prevent the brown coloring of the ready-made developer, the same should be kept in a well corked dark colored bottle ; a few drops of citric acid solution $\frac{1}{50}$ may also be added. Your coloration caused by hydroquinone can be corrected easily by exposing the dry unfinished negative for hours to direct sunlight.

Formerly there was no means known to modify the peculiar yellow character of the negatives developed with pyro, but the writer knew years ago of a method which since that time has also been applied by others and was published. This method is based upon the well-known toning process. Mr. E. Kastner gives the following description in the *Photographische Rundschau :*

Proceeding from the idea that paper prints change their reddish-brown color to a lively gray-violet by a gold bath, I tried in the beginning with gold baths with borax, acetate of soda, etc., without the least success, and only in the following composition I obtained favorable results, remaining always the same. I dissolve in 4 liters of distilled water 1 kilogram of fixing soda, add 120 grms. of ammonium sulphocyanate and 30 grms. of powdered alum, let the milky liquid ripen for a few days, much repeated stirring, and add 150 c.c. of chloride of gold solution, 1 to 200. Into this liquid, decanted and free from any sediment, I immerse the yellow-colored negatives, which take within half an hour a handsome black-violet to gray-blue coloration.

Under certain circumstances, but not always with certainty, a change of tone to a magnificent covering gray-black can also be obtained with Dr. Hesekiel's platinum baths. But for this purpose the negative has to be bathed for some time in a mixture of 30 grms. of alum, 5 grms. of fixing soda, and 1,000 c.c. of water, after which a thorough washing and application of the toning bath takes place.

At very high temperature even otherwise faultless kinds of plates are subject to a light-yellow and red fog during developing and fixing. This generally can be easily avoided or removed. For the latter purpose one of the following formulas can be used :

a. Dissolve 10 grms. of citric acid in.......................... 50 c.c. water.
b. " " alum in.............................. 100 " "

Mix 20 c.c. *a*, 10 c.c. *b* and 100 c.c. water. The plate will become extremely clear and brilliant in this mixture. An equally good mixture is 20 parts saturated alum solution, 1 part muriatic acid and saturation of this solution with boracic acid.

When negative paper and celluloid films are used it happens sometimes that they show also a yellow color.

This can be avoided by application of acetic or citric acid in the developer, the yellow coloration originating only by precipitation of iron (ferrous-oxalate). To clear the negatives, they are simply placed into a bath consisting of 100 c.c. of water, and 3–5 c.c. muriatic acid, after which they have to be washed for some time.

Yellow spots upon unvarnished negatives, caused by nitrate of silver, show ordinarily a great resistance to all attempts of removal. Still, contrary to the

opinion of many photographers, they can comparatively easily be removed and without any injury to the negative. For this purpose a strongly acid fixing bath is prepared of the following concentration :

Fixing soda	200 grms.
Sulphite of soda	50 "
Water	1,000 c.c.

After solution add slowly 6 c.c. sulphuric acid. In this acid fixing bath the yellow spots will disappear quickly if they are not too strong.

A reducing tendency can hardly be observed after even an hour's influence.

We come now to a peculiar yellow coloration of the negative, which takes place frequently and is generally considered yet as unavoidable. This is the yellowing by intensification with bichloride of mercury, and is certainly known to all operators. The reason for this coloration is owing solely to defective washing, whereby hypo remains in the film, thus causing the coloration. It is, therefore, highly necessary to test the plate to be intensified for fixing soda. This can be done in two different methods. The first method is to examine the wash-water of the plate for fixing soda, either after the older iodine test, or according to Belitski's method. For the iodine test a 1 per cent. starch solution is prepared in boiling water ; after cooling about 10 drops tincture of iodine (iodine dissolved in alcohol) are added. The starch solution colors thereby intensely blue. Of this starch solution 1 part is mixed with 9 parts of water ; this mixture is now ready for use. If a few drops of wash-water from the plates are added, discoloration takes place in case the same contains dissolved hypo ; otherwise the solution will remain unchanged. After Belitzki's method nitrate of silver is used for the test. The test is very simple. One or two c.c. of a 2 per cent. silver solution, acidified with acetic acid, is poured into a beaker glass of the size of a common drinking-cup, and the glass is filled with the water to be tested for hypo. With 1 : 10,000 soda the water colors brown in from ten to thirty seconds, and with 1 : 100,000 the color is still of a distinguishable yellow. It is, of course, not necessary to determine the exact quantity of the hypo soda. The most simple way to proceed is to put a drop of silver solution upon one corner of the plate. If the plate contains soda the place will become intensely brown and the negative will assume a yellow color when intensified. However, a badly washed plate with hypo can also be intensified without yellow coloration. This method, recognized simultaneously as Wolffe's and Riesenkonig's, is so simple and sure that it can be executed by everybody and at any time. The as usually washed plate is carefully dried without a previous application of the alum solution, and to accelerate the drying, alcohol may be used. When the film is thoroughly dry, it is soaked for about a minute and rubbed with the palm of the hand. As soon as the surface is uniformly moist a strong solution of mercury is poured upon the same, and this is distributed in proportion to the intensification needed, and then it is poured off. The blackening is done in the regular bathing manner. A plate treated in this way will never become yellow. If, on the contrary, a yellow colored plate is to be restored the application of the above described acid fixing bath is the only known means. By means of the same all yellow or brown spots, originated by intensification, can be removed, whereby, of course, a prolonged influence is required. Plates thus treated have, of course, to be washed thoroughly again ; but an after coloration will not take place, even if the printing is done in direct sunlight.

HYPO TRAYS.

BY H. S. NUTT.

THE material of which the tray is composed in which the photographer, either professional or amateur, uses his hyposulphite of soda, is a matter of more than passing importance.

It should be of some material that is not only unacted upon by any chemicals used in photography, but that water will not affect, or at least an article upon whose groundwork they can have no action.

The best article for the purpose is a highly glazed earthenware tray, known in the market as "porcelain," but among manufacturers as "photo earthenware." It is distinguished from the ordinary earthenware by having a much higher glaze, and one that will not craze, *i. e.*, become full of fine cracks, from sudden changes of from hot to cold solutions or *vice versa*. Even should the glaze be broken the ware is such as not to exert any action on the chemicals that may be put in it, but when perfect it can be easily cleaned.

A few days since a party showed me some lantern slides which were of a deep blue color throughout. What had occasioned it was a mystery, and I started an investigation. The chemicals used in development were all right, the hypo clear and limpid. After a series of investigations it turned out that the tray used for the hypo was of japanned iron, but had become uncovered in places and the water had rusted it, although very slightly. The developer contained prussiate of potash, and the partly washed plate being put into the hypo contained in this tray, had received a deposit of prussian blue throughout. In landscapes, a mild dose would be rather pleasant than otherwise, but in the case referred to it was very blue, so much so that it made the party feel blue to see twelve of his finest slides spoiled beyond redemption by the dense color. The tray had so little rust that when moist from washing it showed nothing, and it was not supposed to be sufficient to cause trouble with any chemical used in developing or fixing.

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

CHAPTER XVI.—METHOD NO. III.

MY own experience of retouching began in Paris, very many more years ago than I care to set down on paper; still, it was not my intention to lay down my own system or systems as being infallible, or the ones fittest for imitation. Indeed, I consider in retouching there is as much freedom as there is in painting. I do not believe in any hard-and-fast method. I wish, therefore, to be as general as possible, and give for instruction the methods producing results which, in my humble judgment, I consider to be the most correct as well as artistic. For this purpose, therefore, I wish to make a few remarks upon the various methods of retouching as practiced in Germany, France and the continent generally.

I will take Germany first, as the methods most practiced there are bold and decidedly artistic. Even when they fail to realize my ideas of what should be negative retouching—which to be really good must preserve likeness—they possess a certain independent merit of their own, entirely owing to their decided and skillful treatment. A good German retoucher treats a head—say the ordinary vignette cabinet size—somewhat as he would a crayon drawing of similar dimensions. This, needless to say, is a rather bold treatment for a negative, and one very likely to efface the leading markings in a finely lighted negative. Still, in this manner I have seen some very

beautiful results produced; but the retoucher must be very skillful, or he will have to pay for the beauty of effect by the comparative loss of resemblance. Now this is a price that, to my thinking, is and ever should be prohibitive as regards portraiture.

He generally begins by very carefully filling up all the transparent spots or lines, as in the methods already described. He carries this out, however, in a slightly different manner to those I refer to, inasmuch as he uses the point of the pencil much more, lightly dotting or spotting until he has removed all the markings—such as blotches, freckles and other optical exaggerations—until the face presents, comparatively, a smooth and even surface, free from all traces of such blemishes.

He now starts upon the modeling of the face, which he accomplishes by means of cross hatching as a foundation, placing a line or touch here and there, as his eye may catch a defective or unfinished portion of the face showing a certain want of gradation.

The next points treated are the high lights, which he at once proceeds to put in their respective places, and then gradually softens into the half tones and shadows, until the negative assumes that appearance of rotundity and delicacy of modulation so grateful to the eye of a retoucher. To produce this effect is the sole object he has in view at starting, and its consummation not only affords him pleasure, but is a kind of reward for his pains and skill.

As a retoucher following this school becomes more and more experienced, so his touches or strokes of the pencil will become bolder and bolder, under which latter treatment a negative will possess much greater artistic value, inasmuch as it will be freed from that mechanical stiffness so generally observable in a beginner's work. As is natural to suppose, broad and bold cross hatching, even in skillful hands, will not always secure a finished picture, so our retoucher of the German school must start filling in all or any of the defects which may appear between the lines or cross hatches. In this way not only a bold and dashing effect may be gained, but also a very "taking" picture will result. Notwithstanding all that can be said in favor of this method it will always have its glaring disadvantages as regards portraiture generally. For what is termed publication pictures it is undoubtedly good, as a brilliant result is sure to be obtained, and the loss of likeness is not in every case a disadvantage. In pictures of this class the resemblance is a matter of very secondary consideration. The "public" will not buy an ugly portrait, especially when it is of some one they do not number among their friends; but they do buy a "pretty picture," and make themselves believe it is also a very correct likeness. Whether the public be right or wrong in this regard I will not dare to offer an opinion; I can only say with the old showman, "They pays their money and they has their choice."

The method practiced most generally by the French retouchers has at least one very great advantage over their German rivals, inasmuch as the likeness is very much less likely to be lost; this, too, although there is but a trifling difference in the handling. Indeed, in most of these methods the commencement is nearly the same, that is to say, the retoucher begins by leveling up or spotting out all the defects on the negative until it becomes even throughout, and then working upon it until it presents a sufficiently soft appearance. When they have worked a negative to this stage (having leveled the face and removed all the inequalities) the majority of good French retouchers effect the necessary modeling by making very fine, long, downward strokes, somewhat curved. This treatment will not produce the effect of that stipple which, I think, would be the most suitable, but it will, all the same, make the face so treated very smooth and soft.

This method, too, is not so vigorous as the German, but as you may easily see upon consideration, the likeness is considerably less in danger of being lost. Personally, I must say I much prefer it to the other, inasmuch as a somewhat similar result may be gained without so much risk of losing what to me always seems the most essential quality of a portrait—the likeness. It is also quite as acceptable in fancy or "publication work" as is its rival.

Before the "dry" plates became generally in use, the old-fashioned collodion plates required the help of a medium in order to give a tooth to the film. As a rule, the negatives were treated with a solution of gum, or a mixture of gum and dextrine dissolved in warm water. This solution washed over the negative (collodion) would give it a surface as readily worked upon with a pencil as a sheet of ordinary drawing paper. Like everything else in life, however, it has its disadvantages, the worst being a certain liability of the film to split when varnishing. This unfortunate quality is, of course, accounted for by the natural absorption of moisture by the gum and dextrine. The Germans, in order to avoid this trouble, mostly retouched on the varnish, using a medium such as already described in order to obtain the necessary tooth for working. So much for old style.

In the modern "dry plate" system this danger of the films splitting is altogether obviated, and each artist can follow out his especial style to his heart's content. We have only to use a medium, of which there are numbers in the market, to give the necessary surface for taking the pencil, and then dash away in pursuit of the desired result. We have, however, unfortunately, at times to put up with a very great trouble, notwithstanding all our advancement. There are various kinds of mediums which, although giving a splendid tooth for working upon, fail to retain the work upon it during the process of varnishing. Necessarily, this misfortune entails double work upon the retoucher, and is nothing short of a calamity to the poor, hard-worked, and (I don't hesitate to say it) generally underpaid retoucher who works "on piece."

The coming off of the work during varnishing may result from a variety of causes. If the film should be slightly damp, the plate not properly treated or too much so, or the varnish not of a proper consistency, all will result in worry and extra trouble for the retoucher. Still, like all who worship, however humbly, at the shrine of art, we must be prepared to take "the rough with the smooth." I may here tell all intending retouchers that they will find much more of the former than the latter as they struggle along. They will also find some difficulty in finding a medium that will make it more toothsome, aud even varnishing will not make it smooth.

There are some very fine specimens of work come from Russia, notably St. Petersburg and Moscow. I cannot positively say how they have been retouched, but, judging from the subjects before me, I feel inclined to believe the German school, but in a modified form, predominates. Vienna, too, sends us some very fine specimens of the photographic art. The retouching there, in my opinion, although very fine and pretty, bears the stamp of being somewhat over-labored. As I said before, excessive work, or too bold and dashing a style, may be all very well for fancy pictures, but they are simply absurd when employed in portraiture. I would not dwell so much on this point were it not that my object has been in this work to treat retouching almost solely in its connection with portraiture; and good portraiture with likeness is to me an impossibility. The more lead one uses the more likely they are to lose the likeness, consequently the less used the better.

Taking a look all round, I think America has sent us as fine specimens of photography and retouching as any country in the world. No doubt there has been a growing tendency to over-work, which has greatly injured the general quality of the work, but a severe reaction has set in, and a better standard of work is being established. Still, the really first-class American photographs, as compared with similar works produced upon the continent, will not suffer by the comparison, and, if anything, less fault will have to be found with them. They do not look so over-worked and hard. Even in cases where we, as experts, know they have been so treated, it will not be observable to the eye of the ordinary observer. The climate of England, generally, is not over favorable to the production of really excellent photography. Still, there are times when it is favorable, and the results gained on such occasions will, I am confident, hold their own beside the best produced in any other country in the world.

A few remarks on the treatment of so-called "Rembrandt" pictures may not be

amiss just here, as I think it will nearly complete our study of retouching and its methods as strictly applicable to portraiture. In many cases this kind of picture will be found somewhat more difficult to manage than the generality of the ordinary lighted ones. Many times photographers attempting this style of lighting either make the light upon the profile too strong or the shadow too intense. To the retoucher one fault is as troublesome as the other. Negatives which might have been capable of yielding very decent results are often spoiled by after intensification, thereby effacing all the details in the light side of the face.

There is no light in nature, however strong, but has detail and modulation, and so also should it have in a negative. "Rembrandts" are mostly profile, so we would start work at the edge of the light upon the forehead, and soften it into the surrounding parts until the temporal arch is reached; in this case the drawing of the arch should be preserved by the placing of a light to show its formation, but always keeping same in harmony with the prevailing shadows and half tones. Great attention should be paid not to efface the modeling, but rather to preserve the relative importance of each detail. There is no indication of the malar bone and the palpebral muscles, which should be lost. I do not mean unduly accentuated, but sufficiently relieved so that they will show well when printed to that density necessary to show off this style of picture to the greatest advantage. There never can be a really good Rembrandt picture which will not print with clear, brilliant shadows.

The light on the nose must be carefully worked, and the drawing of same rectified if necessary, also the corner of the eye, and the ofttimes deep shadow formed by the orbitar arch. In under-exposed negatives the retoucher will have a deal of trouble treating these latter points. The lights on the cheek bone (giving formation to the face), the lips and chin, are all points which demand careful attention. Where the negatives are very defective, owing to under-exposure, the work necessary, both before and after varnishing, can be supplemented by matt varnishing and stumping on the reverse side. This latter must only be resorted to after the ordinary work has been carried as far as possible.

Should there be little or no variety in the tone of the background, a pleasing effect may be produced by indicating a light close to the figure or face on one side (generally the one remotest from the light), and somewhat more distant from it on the other. Before attempting this, examine any portrait so lighted, painted by a good artist, and found your own work on similar principles.

PHOTOGRAPHIC CHEMISTRY.

By R. Meldola, F.R.S., *Cantor Lectures at Society of Arts.*

(*Continued.*)

Continuing the study of those properties of silver salts which are of photographic importance, the next point to be dealt with is the vexed question of the existence of sub-salts. Here, in the present state of knowledge, it is most advisable to avoid dogmatic statements. The utmost that can be done is to summarize the evidence, and to let the student see therefrom that, from a scientific point of view, the existence of such sub-salts has not been conclusively demonstrated. To all who are familiar with the course of investigation in this direction, it will be evident that the current statements in text books, and which are repeated in photographic manuals, must be taught with due caution. I have no time to go over the whole of this familiar ground again, and I must content myself by giving references.* I will only repeat now what I said some time ago, viz., that so far as analogy is to be trusted as a guide, it would seem improbable that the sub-haloid salts of silver should be highly colored

* See "Chemistry of Photography," Lecture I, pp. 49 *et seq;* also *Nature,* vol. xlii, p. 246 (July 10, 1890). A brief historical summary will also be found in Carey Lea's paper on the allotropic forms of silver already referred to. Some of the earliest experiments on this subject were made by Wöhler, and will be found referred to, together with much additional work, in a Report published by a British Association Committee in 1859.

compounds, because the analogous salts of copper, mercury, and thallium are not highly colored.* Now, all the attempts which have been made to produce sub-haloid salts of silver by partial reduction or by other methods give rise to colored products, which have been held by some investigators to consist of the sub-haloids, and by others (Carey Lea) to consist of molecular compounds of the sub-haloids with the haloids proper. It may further be suggested that these colored compounds might consist of oxyhaloids, mixed or combined (molecularly) with the haloids, that in some cases they might consist of metallic silver or its oxide in molecular combination with the haloid, and that in other cases they might consist of the foregoing compounds or mixtures, or of the true haloids colored by the retention of a small quantity of some metallic oxide as an impurity.†

The study of these colored products is of importance to the photographic chemist, whether they are definite chemical compounds or whether they are molecular compounds, or whatever subsequent research may prove them to be. They are of importance to us here, among other reasons, because there may be some relationship between these compounds and the products formed by the photo-chemical decomposition of the silver haloids. I have thought it desirable, therefore, to summarize in a collected form the various methods by which these compounds have been produced:

1. Rose-colored silver chloride, obtained by reducing a hot solution of silver citrate with hydrogen, exhausting the dark product (before complete reduction) with citric acid, and then treating it with hydrochloric acid. Obtained also by reducing the dry nitrate in hydrogen at 100 degrees C., extracting the product with water, and treating the residue with hydrochloric and nitric acids. ("Brit. Assoc. Rep.," 1859, p. 105.)

2. Chocolate-colored chloride, obtained by adding a solution of silver arsenite in nitric acid to a strong boiling solution of caustic soda, when "an extremely black powder" is produced. This, on treatment with hydrochloric acid, becomes gray, and the washed product on boiling with dilute nitric acid loses silver and leaves the chocolate-colored chloride. ("Brit. Assoc. Rep.," 1859, p. 106.)

3. Colored products obtained by acting upon silver with solutions of ferric or cupric chloride have long been known. (Becquerel's films, see G. Staats in *Ber. deutch. chem. Gesell.*, 1887, p. 2322, and 1888, p. 2199.)‡

4. Colored products obtained by Carey Lea, and described as "photo-chloride," "photo-bromide," and "photo-iodide" ("photo-salts").

(*a*) Purple or black chloride, obtained by the action of alkaline hypochlorites on finely divided (reduced) silver.

(*b*) Red chloride, prepared by adding ferrous sulphate to an ammoniacal solution of silver chloride, and then acidifying with dilute sulphuric acid. The precipitate is washed, boiled with dilute nitric acid, washed, and finally boiled with dilute hydrochloric acid.

(*c*) Red, or copper-colored chloride, prepared by heating silver oxide or carbonate to a point short of complete reduction, and then treating the residue with hydrochloric acid.

(*d*) By precipitating silver oxide in the presence of the lower oxides of iron, manganese, etc., and treating the product with hydrochloric acid.

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* Thallous iodide is yellow, and mercurous iodide greenish yellow.

† Since the delivery of the lecture M. Güntz has contributed a paper to the *Comptes Rendus* (vol. cxii, p. 861), claiming to have isolated the sub-haloids by preparing, in the first place, the sub-fluoride by the electrolysis of a saturated solution of silver fluoride. By the action of HCl, HI, H_2S, H_2O, etc., on the sub-fluoride, the other sub-haloids, and the sub-oxide, Ag_4O, are said to have been prepared (see *Nature*, April 30, 1891, p. 620). Seeing the tendency possessed by fluorine compounds to become polymerized, it is, however, by no means certain that the "sub-fluoride," which is described as a crystalline powder resembling bronze filings, has the simple formula Ag_2F.

‡ The colored films produced by this method do not always owe their tints to the formation of a colored product of the nature of a pigmentary coloring matter. The chromatic effect is, in many instances, purely optical, *i. e.*, due to the phenomenon of "thin plates." The colored spectra recently obtained by M. Lippmann are of the same nature; see Berget's *Photographie des Couleurs*, Paris, 1891.

(*e*) Dark purple chloride, obtained by treating finely divided (reduced) silver with a solution of ferric chloride. (Contains 76.07 per cent. of silver.)

(*f*) Red chloride, similarly prepared by the action of cupric chloride.

(*g*) Red chloride, prepared by pouring dilute solution of silver nitrate on to cuprous chloride, and boiling the black precipitate thus obtained with dilute nitric acid.

(*h*) Brownish purple chloride, prepared by pouring an ammoniacal solution of silver nitrate into a strong solution of ferrous chloride, and treating the dark precipitate with dilute sulphuric acid. Becomes lighter with nitric acid. (Similar to *b*.)

(*i*) Purple chloride, prepared by reducing the citrate in a current of hydrogen at 100 degrees C., and treating the product with hydrochloric and nitric acids successively. (Similar to No. 1.)

(*j*) Red and purple shades of chloride, obtained by reducing (partially) a silver salt with alkali and an organic reducing agent, such as milk-sugar, dextrine, etc., and then treating with hydrochloric and nitric acids successively.

(*k*) Red, brown or lavender chloride, produced by treating the white chloride with a boiling solution of sodium hypophosphite. The dark, chocolate-colored product is washed, and boiled with dilute nitric acid.

By somewhat similar methods, colored forms of the bromide and iodide have been obtained; but it will be unnecessary to trouble you with the details, as these will be found in the original papers. (See *American Journal of Science*, vol. xxxiii, May and June, 1887; and vol. xxxiv, July, 1887.) It is quite easy for the student of photographic chemistry to repeat some of these experiments, and to prepare some of the colored products. Especially simple are the processes *b*, *g*, *h*, *j*. The repetition of these experiments will not only be useful as practical exercises, but they will serve to enlarge the ideas of the worker with respect to such familiar compounds as the silver haloids, which, in ordinary work, are generally regarded as mere tests for the halogens, and to show him that a wide domain for exploration lies beyond the region of his ordinary chemical experience. In this connection, also, it is desirable to call attention to the tendency of the silver haloids to retain traces of other chlorides, such as those of iron (ferric), cobalt, manganese, nickel, copper, etc.*

From these special studies of the silver compounds we may now pass to another phase of the subject, viz., the combination of silver and its salts with organic compounds. At this stage the technology, *i. e.*, the sources and methods of manufacture of the more important organic compounds used by the photographer, may be conveniently introduced. The ordinary organic acids, such as acetic, oxalic, citric, tartaric, etc., will, of course, have been dealt with in the preliminary training; but, in addition to these, special attention should be directed to the chemistry and technology of cellulose (including paper, collodion and celluloid), albumen and gelatine. Let it be realized in the course of this work that albumen is of the nature of an acid forming salts with various metals. Show the precipitation caused by such salts as those of mercury and silver. Let the precipitated "albumenate" of silver be collected, washed and dried, and then the presence of silver proved by burning some of the compound, extracting with dilute nitric acid, filtering and testing in the usual way. The similar tendency of gelatine to combine with silver compounds is very striking, and of fundamental importance to the photographic technologist. The best way of approaching this is to let the student make experiments for himself. A sheet of gelatine can be prepared by coating a glass plate with a warm, strong solution of the substance, and allowing it to dry for some days in a warm place. When stripped off, the film is floated for some hours on a solution of silver nitrate, then removed and washed with water. It now remains to be shown that silver in some form or other has actually been withdrawn from the solution, and has entered into combination with the gelatine. In order to prove this, some of the gelatine compound can be dried, and burnt, and tested

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* Carey Lea, *American Journal of Science*, vol. xxxiv, p. 384.

in the same way as the "albumenate." The "gelatino-nitrate" can also be proved to darken on exposure to light. An experiment of this kind will prepare the way for the all-important subject of the preparation of emulsions.

The proportions of materials and the various technical details are fully treated of in all works on practical photography, and need no special description in these lectures.* The first point to which attention must be called is the nature of an emulsion, and the influence of the vehicle in keeping the silver haloids in suspension. An easy experiment will bring this home to the student. To a solution of common salt or some soluble bromide add some silver nitrate, and notice the immediate separation of the silver haloid on agitation. Now take some of the same salt solution, add a little strong gelatine solution to it, mix by agitation, and then again add some of the same silver nitrate solution. It will be noticed that the separation of the silver haloid takes place more slowly, and that, when formed, it does not subside, as in the previous experiment, but agitation simply helps to make the contents of the vessel (now an emulsion) more uniform. A similar experiment may be made with ordinary alcohol and ether containing a soluble haloid ($ZnBr_2$, or $CdBr_2$), and then, by way of comparison, with the same alcohol and ether containing dissolved pyroxyline (collodion).

By such experiments as these the principles of emulsification will be clearly brought out. The student should, in connection with these experiments, be well practiced in calculating the necessary quantities of the different haloids for precipitating given weights of silver nitrate. At this stage the practical preparation of emulsion might well be commenced, and plates should be coated with gelatino-bromide emulsion, prepared in accordance with any of the adopted formulas. This should at first be carried out with the object of imparting skill in the technique of the operations, the scientific reasons for having an excess of soluble bromide, and for washing out excess of soluble salts being explained in the course of the work. These explanations will, of course, only be fully appreciated after the action of light upon the silver haloids has been dealt with, and the practice of emulsion making can, if thought desirable, be deferred to a later period.

(*To be continued.*)

[*From the Photographic Art Journal.*]

A FEW NOTES ON SURFACING GELATINE PRINTS.

BY WALTER E. WOODBURY.

THERE is not the slightest doubt but that gelatine emulsion papers are gradually but surely superseding albumenized papers for direct positive printing. Already one enterprising firm in this country has taken up and succeeded in successfully pushing a paper of this description, and we are promised several others for the fast approaching printing season. The amateur is gradually recognizing the fact that this paper is the best for his purpose. It is very simple to work, and even beginners seem to manage successfully up to a certain point, and here all seem to stick. I have noticed a large number of queries from distressed photographers regarding gelatino-chloride of silver printing, but they are nearly all relating to the same thing—namely, the surfacing. The directions given are usually to clean the glass, rub some French chalk over it, squeegee the prints on to it; dry and remove the prints, which will then have the glossy brilliant surface. "Remove the prints," said an amateur to me once, "if you can." He was a fairly intelligent fellow, too, and succeeded in everything else, but after squeegeeing his prints to the glass "the blamed things stuck like glue," as he described it. I was not long in showing him the right way to do it, and now he gets

* Abney's works are, of course, familiar to all practical photographers in the country. The latest edition of Dr. Eder's *Photographie mit Bromsilber-Gelatine, etc.*, will be found invaluable to those who can read German.

them off every time ; in fact, as he says, they don't give him time to pull them away, for they drop off of their own accord.

I shall never forget, however, my first experience with this kind of work. I know of nothing more aggravating than after carefully finishing a fine positive to your satisfaction, having it stick fast to a glass plate, defying all attempts to remove it, and having finally to scrape it away in shreds to get the glass clean. But a few failures lead to success. I soon found the right way, and curiously enough, when thoroughly accustomed to the work, you become absolutely certain and confident of the result ; not the slightest hesitation nor fear of sticking enters the mind. I once made 5,000 gelatine prints for a supplement to a German photographic periodical. Every one was placed on glass and successfully removed, except four upon one glass plate. These I knew beforehand would stick, but they were the last, and I was tired and weary of the job, and instead of cleaning and preparing the glass again, I took the chance of their sticking, with the result mentioned.

It is in the hope that my experience will be of use to others and prevent more failures than would be otherwise inevitable that has led me to make one or two notes upon the subject as a guide to the worker.

Now, first with regard to the glass. Almost any kind will do, provided its surface is good and free from bubbles, scratches, or other defects. Although plate-glass is usually recommended, it is the least suitable, owing to the porosity of its surface. It must be remembered that in plate glass we have an artificial surface ; the hard outer surface is ground away and a new one made and polished. With this, sticking of the prints is more likely to happen.

To clean the glass I know of nothing more suitable than a brand of soap known as "Monkey Soap," used only for cleaning non-destructible articles. After this the plate is well polished with clean chamois leather or old silk handkerchief. Now comes the critical point, *i. e.*, the application of the French chalk or powdered talc. This is the time when the operator may know whether his prints will stick or not. The chalk must be dry ; a little spread on to the glass plate and rubbed all over with a pad of cotton wool ; with the silk handkerchief it is then dusted off again. Now, what is the appearance of the glass ? Does the chalk adhere still to any parts forming white patches ? If it does the glass still remains imperfect and must be again washed, polished, and treated with the chalk. If the chalk is dry and the cotton-wool in same state, the chalk should leave the glass by just drawing the handkerchief over it once or twice. When this is the case you may squeegee your prints on with perfect safety. and if placed in a moderately warm room they will not be long before they fall away from the glass with the required polish.

If they do not, however, all that is necessary is to insert a sharp knife under one of the corners, and they may be easily loosened. Above all things, make sure that the prints are perfectly dry before attempting to remove them. They often feel dry at the back, while the surface of the print, which is the most important part, and which being furthest away from the air is the longest in drying, is still damp.

Sometimes it happens that a portion of the picture is dry and will come away easily, but other parts stick and must be left to dry still more. This is always bad, as it leaves an ugly, ineffaceable mark on the print.

When the print is apparently dry it is always better to gently warm both sides of the glass before attempting to remove.

After the pictures are taken off, the glass may be used again if simply polished and dusted over with chalk, and the chalk again removed. If any of the powder be left on the plate it will be afterwards noticeable on the surface of the print. It is certainly a fact that the glass plate, after having been used several times, improves considerably, and it soon becomes a matter of difficulty to make the prints stick, should such a thing be required.

Instead of French chalk, other substances, such as wax or oil, can be used. If the

plate be coated with a weak solution of wax in alcohol, there will be no difficulty in removing the prints. A little oil—one drop will be sufficient, rubbed over the plate with a piece of flannel—will have the same effect. There is, however, a marked difference between the surfaces of prints surfaced in this manner and those done with chalk, which in reality has the effect of making the glass thoroughly clean. The latter, of course, are much more brilliant.

There have been many who have advocated the use of ferrotype, ebonite, or celluloid plates instead of glass. There is one advantage to be gained by the beginner, this being that no special cleaning or treatment is necessary for the plate. If the prints are squeegeed on to the polished surface they will leave without difficulty, but the surface cannot be compared with that obtained by the use of glass plates. Further, the ferrotype, ebonite or celluloid plates are very susceptible to mechanical injury; they speedily become scratched, and all these scratches and marks are always visibly reproduced upon every print surfaced on them.

I would not confidently advise the beginner to use anything but glass plates, and let him make his first experiments with spoiled prints, so that the failures will not be so expensive to him. A few failures at first will teach him success. There are two methods that should be noted by which the risk of prints sticking fast to the glass can be minimized. First, by treating the prints to a strong alum bath; this has the effect of hardening the gelatine, and prevents it adhering to the plate. Secondly, by allowing the prints, after well washing, to dry spontaneously, hung over a pole or bar face upwards or upon slanting pieces of blotting-paper or board, and when dry they are just wetted by immersing for a few seconds in water and then laid on to the glass and squeegeed down.

Gelatino-chloride of silver emulsion prints do not require the same amount of washing as albumen pictures; it should be short and thorough. By thorough is meant the continual change of water, not only by a running stream, but by continually emptying the dish in which they are washed. If the prints be allowed to remain for a great length of time in water, the gelatine film becomes slightly decomposed and softens. This will cause them to adhere tightly to the glass, no matter how carefully it has been previously prepared. Therefore avoid prolonged washing, but do not err on the other side by washing too little, as the permanency of the prints will be seriously affected.

A few words might also be said upon the squeegee itself. The flat ones are undoubtedly the best, and far superior to the new-fangled roller absurdities. The India-rubber should be evenly cut, and neither too hard nor too smooth. In squeegeeing never bear too hard upon the print, as the film is likely to be injured; all that is required is to remove all the air between the film and the glass; by reversing the glass this can be easily seen.

As a final remark I would say—never attempt to use artificial heat for drying the prints upon glass except, as already stated, to give a final warmth after the prints have apparently dried spontaneously. It must be remembered that the gelatine film is a soluble one, and the image is easily destroyed by heat. Even if rendered insoluble by an alum bath, the effect of heat will be to cause the film to adhere firmly to the glass plate.

If these remarks be carefully studied by workers with gelatine papers, I should hope to see a less number of complaints in the photographic journals of the difficulties of surfacing gelatine plates.

LONG—I know an artist who painted a runaway horse. It was so natural that the beholders jumped out of the way.

DOWNING—Humph! My friend, McGilp, painted a portrait of a lady that was so natural that he had to sue her for his bill.

[*From The Optical Magic Lantern Journal.*]

A PORTABLE OPAQUE SCREEN.

BY HENRY FIELD.

FOR a long time I put up with the inconvenience of taking about with me, when going to give a lantern entertainment, the long pole, which seems to be the usual appendage to an opaque screen.

Now this screen question is not by any means a difficult one, but it must be remembered that "there is no gain without a loss." The gains in this case are more light upon the screen in consequence of its opacity preventing the light penetrating the material, and thus a large percentage of it becoming lost. Another gain is in the size and convenience of the package in which the screen may be made up.

But now for the loss side of the question. With the opaque screen on a roller there is nothing to do once the hall or lecture room is reached, but to hang it up. In the method I adopt there is a little trouble required after the screen is erected, and a reasonable time must intervene between the time of erecting the screen and the time at which it can be used; but "taking one thing with another," as the song says, the balance of advantages are in my favor, especially if the screen has to be taken any distance.

As far as the material of the screen is concerned, any of the ordinary commercial screens made of calico or linen will answer admirably. These, of course, can be folded in a comparatively small package, but after the screen is erected it must be whitewashed with an ordinary whitewashing brush. This is applied to the front surface of the screen. Of course it must be allowed to dry before being used, but as the drying takes place from the back as well as the front surface, this is only a matter of about twenty minutes. But when the screen is dry, we have a fine and even surface, devoid of any blemish, but not least, an opaque screen like a piece of cardboard.

It may be said that this is all very well while the screen is in its place, but it has to be taken home again—how then? Nothing is simpler; rinse it out in water, and the whitewash will speedily leave the fabric as limp as possible, and after it is rung out wrap it in a piece of mackintosh, and the dampness will not injure anything among which it might be placed. I have a small mackintosh bag for the purpose.

Just a word more. I do not claim the idea as original. I first saw the idea in Berlin, where I have seen it adopted by several lanternists. The apparent whiteness is increased if a very little blue is mixed with the whitewash.

[*From The Optician.*]

THE PHOTOGRAPHIC LENS.

BY THOMAS R. DALLMEYER, F.R.A.S.

THE value of illustrations to give a general idea of instruments is no doubt great, and if the illustrations be accurately drawn to scale, of course they will be of still greater value to a buyer. In most optical instruments, however, something more than the exterior appearance of an instrument is requisite, and further, as year by year we seem to have a more and more initiated public, the more necessary does it become that we should assist by every means in our power in furnishing the fullest information for intending purchasers. I therefore hope that the suggestion for the necessity of accuracy in technical descriptions may be followed by others who are devoting particular attention to one branch or another of the optical trade. With regard to the photographic lens, nearly as much as is possible has been done in this direction, but having thought of one or two useful additions, I have deemed it worth while to mention them. The utility of one was suggested by a letter from the secretary of a provincial camera club, in which he asked what was the meaning of a lens being

described as a particular dimension of plate given in connection with the type of lens: *e.g.*, what does an $8\frac{1}{2} \times 6\frac{1}{2}$ rapid rectilinear mean?—the point of the question being what was the full meaning of $8\frac{1}{2} \times 6\frac{1}{2}$. With the particulars as set forth in opticians' catalogues, at present only one addition is necessary to fully explain the meaning, and that is, that the full diagonal of the circle of illumination covered by the lens should be also furnished. Some types of lenses will only cover very little more than the size of plate for which they are advertised, while other forms will at any rate illuminate, and if well stopped down, cover much larger plates. In addition to furnishing the linear dimension of the circle of illumination covered, it is only necessary to tabulate and remember the linear dimension of the diagonal of any and every current size of plate.

Diagonal of	$3\frac{1}{4} \times 3\frac{1}{4} = 4.58$	inches,	or under	$4\frac{3}{4}$	inches.
"	$4\frac{1}{4} \times 3\frac{1}{4} = 5.30$	"	"	$5\frac{1}{2}$	"
"	$5 \times 4 = 6.4$	"	"	$6\frac{1}{2}$	"
"	$6\frac{1}{2} \times 4\frac{3}{4} = 8.06$	"	"	$8\frac{1}{4}$	"
"	$8\frac{1}{2} \times 6\frac{1}{2} = 10.67$	"	"	$10\frac{3}{4}$	"
"	$10 \times 8 = 12.80$	"	"	13	"
"	$12 \times 10 = 15.62$	"	"	$15\frac{3}{4}$	"

Now take for example a lens advertised to cover a 5×4 plate; if the minimum linear dimension of the diagonal covered by the lens is greater than that of the diagonal of any larger size of plate, it is understood at once that the lens will cover this larger plate if sufficiently stopped down. Further, there is conveyed by this information an approximate idea of how much the sliding front may be moved (without cutting off the corners) either up or down, or sideways, when working on a particular plate. It can always be moved right and left (or up and down) from the center at least half the difference between the diagonal of the full circle covered by the lens and the diagonal of the plate employed. If it is found that the covering powers of the full diagonal of the lens in question only just correspond with the diagonal of the plate, it it evident that it will be unsafe to use such a lens other than in a central position as regards the plate. It may frequently occur that a photographer may wish to employ a lens of a certain focus upon a given size of plate, but he finds on looking through a catalogue that there is no lens, as advertised, distinctly in accord with his requirements. Of course he knows that if the lens of the requisite focus covers a larger plate than that for which he intends to employ it, it will cover the smaller plate, and in that respect the present technical description of the lens is sufficient. Now, if the optician furnished the information suggested, noting that a lens constructed for, say, an $8\frac{1}{2} \times 6\frac{1}{2}$ plate, diagonal of which, $10\frac{3}{4}$ inches, would cover a circle of illumination linear dimension 16 inches, the photographer can see at once that this linear dimension is greater than the diagonal of a 12×10 plate, and hence he knows that by stopping the lens down he is in possession of an instrument that will, if occasion occurs, cover a plate so much larger, and that on using this lens on its own plate there is considerable latitude for movement of the sliding front. It may be moved at least $2\frac{1}{2}$ inches longitudinally or vertically from the central position.

A short time ago there appeared in the *Photographic News* a somewhat similar suggestion from Dr. Vogel, viz., that opticians should express the covering power, or the linear dimension of the circle of illumination included, in terms of the equivalent focus. This, of course, furnishes the same information as that suggested, although I have offered it in a rather more practical form.

The diagonals of current plates would be very shortly as familiar as the dimensions of the current plates themselves, and the column indicative of the linear dimensions of the circle of illumination covered would then prove a very useful addition for the purpose suggested.

To give a proper technical description, then, of a photographic lens, it is necessary to furnish the following information accurately:

I.—General information on the type of lens, which should include: (*a.*) The form and number of combinations and the manner of mounting—illustrations here are useful. (*b.*) The intensity of the full working aperture of the series. (*c.*) The approximate angle included by the series on the longer side of the plate. (*d.*) The concise explanation of the system of diaphragms employed, so that when the exposure for one given stop in a certain light is found the relative exposure for any stop is known.

II.—Then for each individual lens should be tabulated: (1.) The size of the plate the lens is constructed to cover. (2.) The focus for parallel rays. (In the case of portrait lenses, I am still of opinion that a column devoted to back-focus is a useful addition, as it gives a photographer some definite idea of the shortest length necessary for a camera when a portion is built of a solid form.) (3.) The full available aperture that determines the intensity of the lens, and also the diameters of the lenses employed. (4.) The diagonal of the full circle of illumination of the lens, or the guide to the largest plate the lens can cover. (5.) The dimensions of the flange that must be employed, in order that the photographer may know in selecting it whether it can be employed on the present front of his camera.

[*From the Practical Photographer.*]

LANTERN SLIDE MAKING.

BY D. D.

THERE are two methods of making slides: by contact and by reduction through the camera; the former has the merit of being easy; one is not hampered by reason of dull, foggy weather; gas is generally available, or if not gas, magnesium ribbon or an oil lamp are to be had. For contact work, very excellent dry lantern plates are in the market. A very good plan, if the first plates tried are found to be promising, is to purchase a few more boxes at once of the same make and batch.

There are many advantages in the per camera method of making slides—many quarter plate negatives are, from a pictorial point of view, hardly suitable for giving the best results by contact. The subject may be too minute or it may not be quite in the right place on the plate. When we make a slide from such a negative by the camera we cannot only select such portions of it as we require, but also enlarge or reduce it, all in one operation. If this method is decided upon it will be necessary to proceed as follows: Supposing that we wish to make slides from half-plate negatives, a box about 7 x 5 x 12 inches long should be procured; fasten down the lid and remove the ends of the box; blacken the inside with black varnish or Brunswick black; fit a frame or carrier into one end to hold the negative, and see that no light can pass. Place this box arrangement upon a table opposite to a ground glass window, about 12 or 18 inches distant. Opposite the open end erect the camera with the lens, preferably a short focus rectilinear, toward the negative. It is well to remark here that for all copying (and, of course, sliding making, enlarging and reducing) purposes, a camera which can be focused at the back is much to be preferred. It is worth while buying a camera specially for the work. A quarter-plate with wet slide can often be met with at a sale for a trifling sum. I have bought them from one shilling and upwards. Such a camera can readily be converted into a long focus article, and attached to a baseboard will be found extremely useful. The image must be carefully focused upon the screen, which should be marked accurately to the size of a 3 inch square, adjusting the image so as to take in the whole or the chosen part of the negative picture. Use a magnifying glass to get the greatest possible sharpness, and see that the focusing screen and plate in the dark slide are in exact register. The space between the front of camera and the open end of the box should be covered over with a dark cloth during the operations of focusing and exposure.

Dry plates may be used, of course, and the exposure requisite to be given must be a matter of experiment. As a rule this exposure will not be lengthy; thirty seconds

may be tried as a commencement. But the finest method of lantern slide making is by the wet collodion process; and if an amateur wants a few hours pure enjoyment at any time (I speak now of amateurs who have enthusiasm, and who can appreciate the beauties and theories of photographic processes) let him at once invest in a wet bath outfit. The cost will be trifling and the enjoyment considerable.

Any one who goes in for wet collodion must make up his mind to perfect cleanliness in the dark room, in the dark slide, and in the matter of measures and fingers, and for the time the ammonia bottle must be vanished. On the other hand, more light (canary medium) may be used. Briefly, the following items are required: a glass bath and dipper, nitrate of silver solution, iron developer, cyanide of potassium (fixing solution), glass plates. The bath may be purchased already fitted with a wooden outer covering, or a cover can easily be made. Now make up the following silver bath:

Recrystallized nitrate of silver	1 ounce.
Nitrate of baryta	40 grains.
Iodide of potassium	1 grain.
Glacial acetic acid	2 minims.
Distilled water	12 ounces.

Dissolve the salts in separate quantities of water, then add the potassium solution to the silver, and these to the baryta; let it stand in sunlight for a time, then filter; it should be distinctly acid. When not in use, this bath should be kept exposed to light. The above quantity will be more than enough for the dipping bath. After finishing the day's work, pour back into the stock bottle the solution and let it have as much sunshine as possible.

The developer recommended is from the following formula:

Iron sulphate	150 grains.
Methylated spirit	½ ounce.
Glacial acetic acid	½ "
Brown sugar	½ "
Water	10 ounces.

(*To be continued.*)

OUR ILLUSTRATION.

The frontispiece of this issue of the Bulletin is worthy of regard as the work of a professional photographer, yet it is made by an amateur who is at once enthusiastic and hard-working. Mr. Davis was for some time with one of our scenic artists, and being an artist himself, he has infused some of his ideas into his pictures. This accounts for his excellent use of the Seavey backgrounds and accessories in his work. We have seldom had the pleasure of giving our readers examples of amateur work that is so well worth careful study and that exhibits so much thought in posing and lighting. The pictures were made from a number of negatives, and each one is as perfect as the frontispiece of the number of the Bulletin that contains these lines.

In our notes on the second illustration of the last issue of the Bulletin we credited the negative to the President of the Young Men's Christian Association of Brooklyn. This was a mistake that we did not see until our attention was called to it by Mr. Lowery, who, being a modest man, did not like to appear as sailing under false colors, and he has requested us to correct the statement. It should have read "President of the Photographic Section of the Young Men's Christian Association of Brooklyn." It will readily be seen how the omission of a few words changed the sentence.

A CORRECTION.

In the article on "The Influence of Moisture upon Varnished Plates," which is found on page 619 of the last issue of the Bulletin, we note that the word "Japan" is used instead of "Zapon," when speaking of the varnishes. Zapon varnish is a celluloid preparation, while Japan varnish is used for iron work.

ANTHONY'S
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E. & H. T. ANTHONY & CO., Publishers.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the above mentioned society was held at No. 9 Kaga-Yashiki, Tokio, on the 4th of October. The object of the meeting was to give members an opportunity of testing the rapidity of their instantaneous shutters.

A fly-wheel, rotated by a crank and having a silver glass ball attached to the periphery, was fixed up, with a seconds pendulum alongside of it. By watching the seconds pendulum, it was very easy, after a little time, to make the wheel revolve at a uniform rate of sixty revolutions a minute, or one a second.

Immediately that a uniform speed of sixty revolutions a minute had been attained, an exposure was made with the shutter to be tested. On development of the plate, the angular motion of the wheel was indicated by the length of line traced out by the silvered ball, and it was a very simple problem to work out the exposure in the form of a fraction of a second.

The shutter that worked the most quickly was the "Caldwell." This, at its highest speed, gave an exposure estimated at only one one hundred and twenty-fifth of a second. Of the rapidest of the other shutters tried, none gave as little as twice this length of exposure. The longest exposure that was "instantaneous" (not "time") was one-thirteenth of a second.

Photographers who do "instantaneous work" have generally notions, vague to say the least of it, about the exposures they are giving. The tests made by the Photographic Society of Japan go to prove that by far the greater number of "instantaneous exposures" are somewhat between one-twentieth and one-fiftieth of a second.

An interesting feature of the meeting was a trial of speed, by several of the members, in hand exposures, "cap off and on." It was shown that more than one member could give an exposure as short as one-fifth of a second by hand, and that without shaking the camera at all. It was found advisable to use a very loose cap.

The following gentlemen were elected members of the society: Mr. E. Beitter, Mr. J. Rickett, and Mr. S. Suzuki.

This report has been delayed on account of the time necessary to work out the exposures of the various shutters, from the markings on the plates exposed. W. K. BURTON.

PHOTOGRAPHIC SOCIETY OF KANSAS CITY.

THE last regular meeting of the Photographic Society of Kansas City, held on October 28th, was of more than ordinary interest. The attendance was full and a great deal of interest manifested by the members. The new studio and apparatus have been fairly tried and found to be in nice working shape, all the appointments being very complete. A number of excellent negatives, work of various members in the new rooms, were shown and much admired.

The special order of the evening was a well written paper on portraiture by Mr. W. H. Perrine. This gentleman is one of the best posted and most careful working amateurs in Kansas City, and it is a foregone conclusion that any ideas he may present will be carefully studied and full of interest. His paper on portraiture, in addition to being well written, was full of careful thought and replete with choice ideas and suggestions as to lighting, posing and general effects. The paper was listened to with careful attention, and at its conclusion was discussed quite generally at considerable length.

The regular meetings are held once a month, but at the last meeting a resolution was adopted providing for special meetings to be

held on the second Wednesday evenings in each month during the winter months, for the reading of papers, exhibition of work, etc.

Before adjournment a resolution was adopted returning the sincere thanks of the society to Anthony's BULLETIN, *The Photographic Times*, *The Eye* and *American Amateur Photographer* for substantial courtesies extended, also thanks to the Blair Camera Company, of Chicago, for sample dozens of the Allen & Rowell dry plates.

CHICAGO LANTERN SLIDE CLUB.

As the opening meeting of our winter season was for the purpose of gathering together and testing slides enough for our interchange box, the old stand-bys were present with evidences of work and interest in seeing our club well represented.

To the surprise of the Executive Committee more than one hundred slides were turned in, and in a few days we shall ship to New York a set of slides which must certainly pass thorough examination, and we do not expect to find the box cut down by the managers of the Interchange, because of lack in interesting subjects or perfect slide work.

Professor S. W. Burnham, of Lick Observatory, has remembered his club by generously and kindly sending ten beautiful views taken in Cayenne, S. A., during his trip of observation last year.

Mr. Karner has an interesting lot of slides from Old Mexico, taken during his vacation. Rev. Dr. Breed has a few colored slides which show patient, careful work, comparing well with any professional work we have seen.

Mr. W. B. Judson has an excellent set of views from Southern California, including both exterior and interior views of Santa Barbara Mission, and a portrait of the Father Superior, J. J. O'Keefe, one of only two Irish gentlemen ever admitted to the order of Franciscan Friars; also beautiful views around San Diego and Coronado Beach.

Mrs. N. Gray Bartlette has contributed more than her usual number of beautiful child studies, and some of these are delineations of Mother Goose Melodies.

Mr. Robert Berger has a fine selection of Lincoln Park views, including The Grant Memorial Equestrian Statue from three different points.

The Secretary shows a set of Illustrated Chicago and a few of the completed Sky Scrapers, for which our city is already becoming famous.

We are congratulating ourselves that our work is done, and counting upon seeing the work of the American Lantern Slide Interchange this winter, hoping none of its members have dropped out.

W. A. MORSE, *Secretary*.

THE COLORADO CAMERA CLUB.

THE Camera Club was put on a working basis at the meeting at the office of the Overman Wheel Company, October 31st. The meeting was called to order by Mr. W. E. Miles, with the following persons present: J. A. Chain, L. Lehn, L. B. Carr, H. S. Bellsmith, E. W. Irish, T. J. Morrill, E. A. Green, H. G. Kennedy, A. Martin, J. K. Rose, J. Collier, C. H. Wells, J. L. Ross, Reinhart, C. C. Capwell, F. W. Hubby, W. H. Jackson, E. H. Simonson, F. W. Hart, W. E. Perkins, F. F. Chisholm, Misses S. E. Hays and L. A. Perry.

A stock company will be formed and each member of the club must have at least $10 invested in the stock. The Committee on By-Laws will fix the amount of dues, but it will very likely be about $2.50.

The election of officers resulted in the selection of the following: President, W. H. Jackson; Vice-President, F. W. Hart; Secretary, C. C. Candy; Treasurer, W. E. Miles; Corresponding Secretary, H. S. Bellsmith.

Committees were appointed for the formation of by-laws and selection of quarters. Twenty-six members were enrolled as charter members of the club. They adjourned to meet November 7th, at 7.30, at the rooms of H. S. Bellsmith.

CAPITAL CAMERA CLUB EXHIBITION.

THE Capital Camera Club exhibition, which closed October 31st, was a most creditable one. The spacious quarters of the club, corner Seventh and D streets, were thrown open to visitors, who were thus enabled to see the inside workings of an amateur photo club, with its gallery, dark rooms, etc. Something like 100 framed pictures were shown, many of the frames containing a large number of prints. Mr. F. W. Barrett exhibited one of twenty-four life scenes in Manitoba. Mr. Le Breton's work was of a high character, comprising bromide, platinum, and silver prints and enlargements. His "Thanatopsis Illustrated," the illustration being a view in Marin county, Cal., well suited to the quotation, is a piece of artistic work worthy of great praise.

An old mill near Newport (bromide enlargement), "Ready for the Ball" (a portrait of a handsome woman), and "Sweet Sixteen," by

the same author, were also very creditable. Mr. F. J. Cullen was represented by some very good work. "On Parade," a large panel, was much admired. So also were a large print of the new Lemon building, and several portraits printed on porcelain. Mr. F. B. Dante was represented by a number of creditable landscapes; the frame containing the Aqueduct and Cabin John's Bridge were his best efforts. Dr. Arthur J. Hall had a couple of Emergency Hospital scenes. Mr. John E. Mitchell's views of Rock Creek were dainty pieces of work, and a large frame of portraits taken in the club rooms (as were most of the portraits exhibited), was also admired.

Mr. Poynton was represented by some first-class portraits and groups; Mr. Albert L. Moore by eight views. Mr. Briggs's "Happy Family" was a cute representation of a dozen kittens at breakfast. The enlarged bromide of Mr. Beall's little Cubans diving for coppers was one of the most interesting in the collection. Ferns and potted plants ornamented the rooms. It is the intention to have a permanent exhibition of pictures, to which changes will from time to time be made.

The exhibition was the most successful yet held in Washington. It opened October 29th.

Bibliography.

THE PHOTOGRAPHIC IMAGE. By P. C. Duchochois. New York: William R. Jenkins.

This is a neatly printed volume of over 200 pages, by one of the best practical as well as one of the best posted theoretical photographers now living in America. But any commendation on our part is unnecessary, as the readers of the BULLETIN are well acquainted with Mr. Duchochois from his contributions to these pages. The book before us is in the well-known thorough style of the author, and covers the ground undertaken very completely. It is divided into an Introductory Section and three other parts, the Introduction explaining the effect of exposure and development from a theoretical standpoint; Part 1, the chemistry and behavior of the compounds employed to develop the photographic image; Part 2, the development in the gelatine process; Part 3, the development in the collodion and silver bromide processes. It will thus be seen that the author has covered the ground in a most thorough manner for both the wet and dry photographic processes. In the small space at our disposal it is impossible to give even a fair estimate of the care with which this volume has been prepared. It contains the cream of a long practical experience in both the wet and dry photographic processes by a veteran in the art and one of the best photographic chemists with which we are acquainted. Photographers of all classes, both amateur and professional, will find this book original and trustworthy and a good helper in time of need. We hope the author will realize such a sale of the volume that shall repay him for his careful work.

"PHOTOGRAPHY" ANNUAL. Edited by Henry Sturmey. London: Iliffe & Son.

This bulky volume has been on our table for some time, its immense size (over 1,000 pages) and its peculiar structure making us afraid to dip deeply into its contents at one sitting. After spending several periods of meditation among its pages, we have at last obtained some idea of its value and the purport of its existence. It appears to aim at being a photographic year-book and at the same time a kind of annual index of the photographic novelties that have appeared during the past twelve months. The articles are of the best and by the best writers of England, but we think that they are somewhat buried in the mass of decidedly secondary information about lenses of different makers and similar topics that is sandwiched between them. It would not be so bad if the literary part of the volume was confined to one section, but it is scattered among advertisements and tabular matter in the most provoking manner. Nevertheless, we can conceive some people who like this mixture of photographic materials and photographic science, but for us it has no charms and we question its utility. The volume is an exhibition of marvelous patience on the part of the editor, and we hope he will have his reward.

PHOTOGRAPHISCHE KUNSTLEHRE. By Dr. H. W. Vogel. Berlin: Robert Oppenheim.

This is the fourth part of Dr. Vogel's "Handbuch der Photographie," and like all his works, exhibits that careful and trustworthy attention to details that is so welcome to those seeking the truth in modern literature. The volume is a large octavo of 200 pages, beautifully printed and finely illustrated. It treats solely of the purely technical part of the art of photography, such as is most needed by the artist in the studio. To give an idea of the scope of the work, we will name the

various topics in the order in which they are taken up by the author: 1. Photography and Truth; 2. Light and Lighting; 3. Photography by Artificial Light; 4. Perspective; 5. Arrangement; 6. Contour and Lines; 7. The Arrangement of the Human Form; 8. Garments and Draperies; 9. Character; 10. Proportion; 11. The Contact with the Public; 12. Children's Negatives; 13. Instantaneous Pictures; 14. The Filling out of the Frame-work (of the Picture), size of card mounts, Accessories and Backgrounds; 15. Anatomy of the Human Head and Retouching; 16. Landscapes and Architectures.

Each of the topics mentioned above is treated in a very practical manner and the ideas are well brought out by the use of excellent illustrations, often taken from well known artists and the works of the old masters. We know of no book in any language which is so thoroughly and completely in harmony with the rules of art and at the same time adapts them to the circumstances of the photographic studio. Even those who have but a limited knowledge of the German language will find the book useful from the fact that the great care in the selection of the illustrations gives them a value by themselves without the text. We are more than pleased with this volume, and congratulate Dr. Vogel on the success he has attained in bringing before the working photographer the application of the rules of truth and art in so complete and plain a manner. To all our readers who are conversant with the German language we strongly recommend this latest and best of Dr. Vogel's many contributions to the literature of photography. We hope the time is not far distant when an English translation of the work will be available.

Traité Encyclopedique de Photographie. Par Charles Fabre. Paris: Gauthier-Villars & Fils, 55 Quai des Augustins.

We have before us the last and concluding part of this handsome French work on photography. The fact that it is published by Gauthier-Villars is a sufficient guarantee of its being finely illustrated and printed. It forms four handsome volumes, and for those who can read the French language it is by far the best book on photography in that tongue. It is a veritable store-house of photographic lore, well written, finely illustrated and handsomely printed. It should be in the library of every photographer understanding French and who wishes to have a reliable reference book at hand.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the Bulletin. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—Mrs. K. L. writes: I have a Hawkeye camera and I greatly admire the blue prints that may be made from my negatives. I hear that you have published a formula for a liquid for toning these prints to other colors, such as green, red or lavender. Will you kindly tell me what it is?

A.—There are several methods for toning blue prints. The first step is to decompose the blue compound with an alkali, such as soda or ammonia, then to convert the iron oxide into some other compound. The prints should be printed quite dark and then washed in a bath of weak hydrochloric acid, say ten drops of strong acid to the pint of water. After the washing, place the prints in a bath of ammonia (one part of strong ammonia in eight parts of water), or in a bath of caustic soda (one part of caustic soda in twenty parts of water). At this point the prints will have a more or less brown tone according to the time they remain in the bath. If this tone is the one desired, wash them well in plenty of clean water, and finally in weak acetic acid (one part of the commercial acid in ten parts of water). If a black tone is desired, place the prints from the soda of ammonia bath into a bath of tannic acid in water. This will give a tone ranging from purple to black, according to the strength of the tannic acid solution. One dram of tannic acid in a pint of water is a good strength for the bath. If a green tone is desired, use a bath containing gum catechu instead of the tannic acid. A solution of pyro under the same conditions will give a purple tone.

Q.—J. S. writes: I have used N. P. A. albumen paper for several years and it has given good satisfaction. But there is one part of the toning formula that I do not understand. The double fused acetate of soda I can never get. Is there any difference between this and the ordinary acetate in crystals?

A.—The pure white crystals of ordinary acetate of soda will answer equally as well as the fused acetate. The reason for the use of

the fused acetate is when the ordinary acetate is colored by organic matter. This organic matter causes irregular toning, and by fusing the acetate this irregularity is overcome. See article on this point in BULLETIN for December 13, 1890, page 705, entitled "Some Points often Overlooked in Toning."

Q.—C. & F. writes: We are photographing furniture and our customers want the prints mounted back to back. What we would like to know is how to do such mounting and not disturb the albumen in silvering the back of the paper?

A.—The best way to work, in our opinion, is to make the prints in the ordinary way on single coated albumen paper, that is paper albumenized on one side only, and then mount the prints back to back. Or you can mount them back to back on thin muslin paper which is sold for such purposes. Burnish with a card on the face of the print on the side to the rough roller.

Q.—J. E. writes: Inclosed I send two prints showing a precipitate on the surface which seems very difficult to remove. I have been troubled with this frequently of late, and cannot account for it. Can you give a cause and remedy? I have thought it was the water and changed, but I am troubled to some extent still.

A.—We are at a loss to tell just what is the cause of the trouble. Try adding some acid sulphite to your fixing bath, say 2 ounces of acid sulphite to the quart of bath. This compound has a wonderful clearing effect and may help you.

Views Caught with the Drop Shutter.

WE regret to note that Mr. W. H. Hill, the photographer, formerly of Elizabeth, N. J., has recently lost his son, on whose account he moved to Passedena, Cal., but without avail. We extend our sincere sympathy.

CAPTAIN J. W. MORRISON, the well-known photographic merchant of Pittsburgh, Penn., was recently elected State Treasurer on the Republican ticket, with a majority of 60,000. Photography is making itself felt in politics in the Keystone State, and we offer our congratulations.

W. L. SUTTON, of Hornellsvelle, N. Y., has moved to improved quarters on Main street, in that city. Here he expects to make even better work than heretofore, although he has a fine reputation in his locality. The appointments of his new studio are of the best, and his life-long experience is a sufficient warrant that his productions will sustain his reputation as a veteran artist of high grade.

H. R. MARKS, of Austin, Texas, who was burned out several months ago, has refitted his studio in a handsome manner, and is again at work. He appears to be working harder than ever. Energy always has its reward.

L. C. POWELL, of Casey's studio, at Birmingham, Ala., committed suicide on October 21st, by taking morphine.

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ANTHONY'S

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EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

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PICTURES FROM TYPE BLOCKS versus PHOTOGRAVURE.

WITH the increasing use of half-tone work and the numerous processes for book illustration that have been developed or adapted during the past ten or fifteen years, there has steadily grown a tendency on the part of publishers, process men, and in some instances among critics, to apply entirely inappropriate names to the reproductions, that are misleading in the extreme and cannot but do an injury to the better classes of work by giving their names to processes much their inferiors in quality.

In very many cases these misappropriations are not so much the result of ignorance, as a desire to profit by stolen glory that attends their use, and this is just the point at issue. An instance in point is as follows: One of the New York dailies, in reviewing a recent publication of a Western house—which, by the way, contained 255 pages, printed on fine cream-laid paper, with thirty-two illustrations, most of them full-page, and the retail price of which was only fifty cents—speaking of the prints, says: "The illustrations are examples of the highest class of photogravure art." This statement is as false as it would have been had they said that the book was printed on vellum, as the illustrations were but a very ordinary collection of prints made from half-tone type plates in relief; and it is just here, between relief plates and intaglio plates, that the misapplication of terms is apt to occur.

Many who should, and probably not a few who do know better, seem to argue that since all photogravures are half-tones, then all half-tones must be photogravures. It may just as well be claimed that all bass-horns being musical instruments, every musical instrument is therefore a bass horn.

Now we believe that a bass-horn serves a useful purpose in its proper sphere, but that it would make a poor show masquerading as a flute. We also believe that there is a wide field and use for the half-tone processes which produce type

plates in relief, but contend that under no circumstances should such a plate be referred to as a photogravure, for the reason that the very term photogravure implies an intaglio, the exact opposite of a relief plate and subject to entirely different conditions and results.

Let us first consider the ordinary half-tone photo-engraving of which so much has lately been seen in the way of illustrations for the higher class periodicals and works of an art and technical nature. We shall find that these prints all render the half-tone of the original; or to be less technical, show the various degrees of light and shade, in masses of color, differing in degree, but in flat tints, produced by breaking the original subject, that may have been either a wash drawing, painting in color, portrait from life or view from nature, into an immense number of dots, obtained by photographing through the fine meshes of a ruled glass, in a manner not necessary of description here.

The resulting picture is transferred to the metal that is to serve as the finished plate; the chemical action is proceeded with and the half-tone plate that results shows the picture in relief and the entire surface of the plate a mass of fine points or dots, separated by fine furrows running in transverse directions, the points in relief being the printing surfaces. The plate being blocked on wood or metal to render it of the same height as type, it is inked up with a roller in the same manner that type is, and the ink, adhering to the points, is impressed into the paper that is brought in contact with them in the printing press. It should here be noted that the points or dots making up the printing surface of the plate, being all of the same height, the amount of ink deposited on the paper is of the same depth or thickness from each and every printing point, and it naturally follows that variations in the light and shade making up the picture are dependent on the number and size of such dots within a given radius; thus a heavy shadow in a picture printed from relief plate, will be seen to be composed of a large number of these dots, often so close together as to merge into one another, while the high lights are the result of a preponderance of the clear transverse lines, that serve to separate the dots more widely, only showing them sufficiently to give form and color to their object.

The above are the principal points of identification of a print made from a half-tone type plate in relief and are easily to be distinguished from pictures produced from intaglio plates, as will be shown further on. There is still another kind of half-tone relief work, however, that is not so easily distinguished, and this is the photo-gelatine or heliotype and kindred processes, which in rendering the gradations of color, do not cut them up into dots, but lay the ink in smooth masses of different tones on the paper from a surface of gelatine. It is not the intention of this article to go into all the varying methods of printing in relief, but merely to contrast as strongly as possible the wide difference between the rightful photogravure and the many cheap illustrations printed in a type press, that have so frequently been foisted on an unsuspecting public under the guise of such.

The photogravure is printed from an intaglio plate, and is not capable of being used in a type press under any conditions. It can only be successfully printed by an expert, and where with a relief plate, the office boy might "kick off" say, a thousand a day, or the steam cylinder press ten thousand, the expert printer with his intaglio plate would not produce above two hundred good impressions. The intaglio plate is filled while warmed, with a hard, stiff ink, which is pressed

into every depression, and after the high lights of the plate are carefully "wiped off," by hand, the plate is run through the press, in connection with the paper, and the latter lifts from the sunken surface of the plate all the ink it has previously received, holding it on the surface of the paper in masses of color that differ in depth and consequently in tone, according to the depth of intaglio in different parts of the plate, the result of which is a series of gradations from the pure high light of the clear paper, to the rich, velvety black of a solid body of ink spread over the surface of the paper and not pressed into it. The grain, too, of this plate, instead of being composed of noticeable cross hatchings of lines and dots, is a scarcely discernible "tooth," that is obtained by chemical action on the metal plate before the picture to be etched is transferred thereto. Carbon tissue, being the medium through which the transfer is made, and the finished print very closely resembling in most of its features that beautiful pigment, it is a wonder that the feeling of those interested in seeing justice done to all, has not been more forcibly expressed on this subject before.

A name that would answer the purpose and still be meritorious, is the old title photoglyph, as it applies to all plates which give reproductions from relief surfaces, while photogravure is properly used only in the opposite connection. Let all then who know better, be honest enough to call things what they are and thus do what they can to avoid further complication of the already multitudinous collection of process names in existence both in this country and abroad.

EDITORIAL NOTES.

A most interesting surgical operation is reported from one of the German hospitals, where a portion of the cornea of the eye, which had been injured and turned to a dark brown color by the action of nitrate of silver, was removed by a very minute trephine, and a portion, the same size, from the cornea of a young rabbit inserted in its place; after a few weeks the eye had completely healed, and the color of the entire cornea was perfectly transparent.

We are in receipt from our good friend Mr. J. Boothroyd, of Bolton, England, whose article on development in "The International Annual" has caused considerable comment, pro and con, of several prints made from his negatives after the manner described by him in the article mentioned. If they are a fair sample of all his work they must prove a strong argument for long development, for they are without exception excellent, and possess a quality rarely seen in photo prints except with the aid of the stereoscope, that of atmosphere and distance, there being noticeable in every one a relief and atmospheric effect quite remarkable. We are very glad to have seen them, and congratulate the artist on his success.

Two prints, from the hands of one of The Bulletin's old readers, Mr. J. N. Bradford, of the Ohio State University, are also before us, and show a fine artistic sense of the beautiful in nature and a thorough technical knowledge of the manipulation of materia photographica ; they are both gems and should be seen to be appreciated.

An Amateur Photographers' Society is proposed and about to be organized

in Erie, Pa. There should be good material for such a movement there, and we wish them success.

The annual election of officers of the New Orleans Camera Club took place on the 4th inst., and resulted in the election of E. L. Bowman, President; P. E. Carriere, Vice-President; R. S. Charles, Jr., Secretary, and W. M. Rhodes, Treasurer.

We note with much pleasure that the scientific researches and discoveries of Professor Hermann von Helmholtz, of Germany, have been recognized by he Emperor in his promotion to the position of Privy Councilor, which carries with it the title of Excellency.

A new method for the reproduction and electric transmission of a photograph or artist's drawing by telegraph is in process of development by N. S. Amstutz, of Cleveland, Ohio, who has already patented his device, which, as we understand it, consists in photographing on a film surface the subject for transmission, and then mounting the film on a cylinder, that revolves under a tracer, working a vibrator in telegraphic communication at some distant office, thus reproducing the raised and depressed surface of the film in such a way, upon hard wax, as to form an excellent matrix, from which it is easy and rapid work to obtain stereotypes or electrotypes. It is said that the reproductions produce an excellent half-tone print in relief, and we wait the perfection of the process with interest.

A new principle in the manufacture of drop shutters has lately been applied by an English maker, who regulates the time of exposure by a bob or weight attached to a tape; varying lengths of exposure are regulated by different lengths of tape, which are allowed to fall before the bob acts, the length of tape being dependent on the weights and also on the shutter aperture. Several modifications are suggested, such as having the tape of an arbitrary length and the shutter aperture variable; or where the slides of the shutter may be separable and joined by varying lengths of tape.

The Hartford Camera Club will join the organization known as the American Prize Print Interchange, whose plan is to submit to a committee of members all prints entered in competition, the committee to award three prizes of $5, $3 and $2 respectively for the three best prints, and to distribute among the winners in the ratio of 50, 30 and 20 per cent, the money received from entrance fees. Copies of the prize pictures of each club in the exchange will be sent to all the other clubs, and will form a very interesting collection of work.

Mr. Charles H. Davis, the well known amateur photographer of this city, gave an exhibition of lantern slides of his own production before a large audience at Plainfield, N. J., on November 3. The exhibition was under the auspices of the Plainfield Camera Club, an organization which Mr. Davis was instrumental in starting when a resident of that city about seven years ago. The slides were of the highest order of merit, and were enthusiastically applauded.

Considerable activity is reported among the French amateurs in making two

or more exposures against black backgrounds with magnesium light, for the purpose of obtaining bust and statuette effects. Many of these are quite startling and extremely realistic, and at the same time not at all difficult to make. A great many grotesque groups and figures are the result of these experiments.

Recent photographs of the milky way show the "coal sack," so called, and until lately supposed to be void of stellar bodies, to be completely filled with stars of greater or less brilliancy; only going to indicate again the enormous magnitude of the work undertaken by the Astronomical Congress.

The third and fourth lectures under the auspices of the New York Camera Club will be given on the evening of December 7th and 21st next; the former by Wallace Goold Levison on "Instantaneous Photography as an Aid to Science, History and Art," and the latter by the Rev. Charles R. Treat on "The Fair City of Florence."

The Colorado Camera Club of Denver, Colorado, has incorporated with a most promising beginning. It is proposed to have a capital stock of $1,000, divided into 100 shares of $10 each. A large part of the stock has already been taken and active measures are under way for the securing of proper accommodations for the club. We wish them a prosperous consummation of their plans.

Prof. Berthelot recently exhibited before the Paris Academy of Sciences a piece of silver which, though chemically pure, was the color of pure gold. The change in color was due to the fact that the silver was reduced by the aid of citrate of iron from the salt of silver. A result similar to this has been achieved by M. Carey Lea. We shall refer to this again in our next issue.

At a recent meeting of the Tyneside Camera Club of England a set of prints were shown which had been made from whole plate negatives with only two periscopic spectacle lenses placed in close contact with the concave sides together. A very small stop ($\frac{1}{16}$ inch) was used immediately in front of the lens, and the result was rectilinear and clean cut to the edge of the plate.

F. G. Warner, of San Francisco, has just returned with an exploring party who have been in the high mountains of the Northwest since the spring, and who reached an altitude on Mount St. Elias of 14,500 feet. Over three hundred good photographs were obtained, which are of great scientific and general interest.

The Cincinnati Camera Club have lately closed their mid-season exhibition, which was of an unusually high order. The exhibit was large and of a most creditable nature.

One of the main difficulties which have been encountered by the originators of the new developing agent, para-amadophenol, has lain in their inability to obtain it in sufficiently concentrated solution; but we understand that they have now overcome it and can produce it at a power of fourteen per cent., which is more than ample to produce the agent they require. It is still expensive, but

being so powerful and possessing the lasting qualities that it does, it is in the end much less costly than might be supposed.

In the "Letter from Germany" in the BULLETIN of July 25th our attention has been called to an error in the formula for determining the brightness of the sky. It should be "J cosec. α" instead of "$\frac{J}{\text{sine } \alpha}$," if J is the intensity of the sun. See page 424.

[*From our Special Correspondent.*]

ENGLISH NOTES.

THE principal—or what is considered the principal—photographic exhibition of the year—that held in Pall Mall by the Photographic Society of Great Britain—opened on September 26th, for a "season" of six weeks. A very pretty little row accompanied the opening. A new assistant secretary—a young and *active* man—was appointed some short time back, and he "made his presence felt" by disqualifying and ordering to be removed the best set of pictures in the show (those of Mr. George Davison), on the ground that they had been delivered a day or two too late. Then he is said to have ordered Mr. H. P. Robinson—one of the vice-presidents of the society—and another member (Mr. Maskell) to leave the exhibition room, where they were doing something a day or two before the opening; threatening at the same time to expedite the movements of the latter gentleman by the aid of a policeman. I think it very probable that the energetic young man will be found to have been "technically right" in his proceedings, but the result will doubtless be an addition to the number of "historical rows" for which the society was at one time famous. The fact is that the Photographic Society of Great Britain is wholly behind the times, and has missed great opportunities. Its President, Mr. James Glaisher, is a worthy octogenarian, out of touch with the new men and the new school, who clings to office, and will not see that he would best serve the interests of the society by gracefully retiring to make room for a younger man.

News comes from Germany of the wonderful effect of oil of turpentine as an accelerator when two or three drops of it are added to a developer consisting of hydroquinone and caustic soda. The plan is well worth a trial (which I hope shortly to make), and this should be done by exposing a plate in the camera, then cutting the plate in half, and treating one half with the ordinary quinol developer, and the other half with a similar developer to which a minute quantity of the oil of turpentine has been added.

To return to the Pall Mall Exhibition. The judges were badly selected, only one or two of the five names commanding any confidence, and they appear to have sought to give themselves importance by awarding as few medals as possible. One of our best amateurs, Mr. Cembrano, receives a medal for a charming river scene, entitled "Sunset—Winter;" Mrs. Main (the widow of the late Colonel Burnaby) is similarly honored for a good "Snow Scene;" Mr. R. W. Robinson (son of the famous "H. P.") gets decorated for "A Primrose by the River Brim," and Mr. W. M. Warneuke for a big portrait—"Desdemona." Then the Autotype Co. and Mr. F. L. Colls each receive awards for their mechanical reproductions; Messrs. G. West & Sons are honored for their lantern slides; and the Paget Prize Plate Co. get recognition for a very clever

plate-cutting machine, which, worked by steam, will cut 100 dozen whole plates per hour into either halves or quarters. Thus only eight medals are distributed among the two hundred and forty exhibitors; and of these only five are for pictures. Some very fine work by J. Gale, A. H. Hinton, B. G. Wilkinson, A. R. Dresser, W. R. Cassels and Lyddell Sawyer goes unnoticed by the judges.

Mr. C. W. Hastings, the able editor of the *Amateur Photographer*, has had a "happy thought" in connection with the Pall Mall Exhibition; he has published an admirable reproduction by Woodbury-gravure of twelve of the principal photographs exhibited, mounted upon 15 x 12 boards, and with descriptive letterpress by Mr. H. P. Robinson. The price is only half a guinea, and the publishers are Messrs. Hazell, Watson & Viney, of Creed Lane, London.

The latest photographic novel is Grant Allen's "Recalled to Life" (Arrowsmith, 3s. 6d.), wherein the heroine is found, at the opening of the tale, in a room alone with her murdered father. The said father has invented a machine camera, which takes six instantaneous photographs in succession by the aid of an electric light. During the murder the machine has "gone off" and has presumably taken six pictures of the dreadful scene; but of the six only *one* negative can be found, and this is a back view of a man escaping from the window, and must therefore have been the last of the series. The heroine has entirely lost all memory of the scene and of everything in her life which happened *before* the dreadful occurrence. Her health is restored, but not her memory, and she devotes her life to the discovery of her father's murderer. She finds at last in a "snap-shot" photo of some athletic sports a man with a back precisely like that in the "machine photo," and she travels to Canada after him. He turns out to be her old lover; and he is also in possession of the five missing negatives. These show that the murder was not a murder; but that the dead man, who was an impostor and not the heroine's father at all, was killed by the young lady herself in self-defense. The story is an exciting one; but we fear that Mr. Grant Allen would find it difficult to answer the questions which a practical photographer would be inclined to ask.

The Liverpool Photo Society has prepared a series of lantern slides entitled "Illustrated Liverpool," which will be sent over to the States in return for the set entitled "Illustrated Boston." It appears to me that this work of making photographic surveys of given districts is about the most useful thing which a photographic society can do.

There is a prospect that ferrotype dry plates (tin-types) may again, to some extent, come into use. Mr. L. Nievsky has made, and Messrs. Fallowfield are selling ferrotypes which only require an exposure in the camera of five seconds under average conditions, and which can be turned out complete as finished positives, within five minutes after removal from the dark-slide.

Our optician—the younger Dallmeyer—has inherited his share of the talents of his father (the Dallmeyer), and his grandfather (the equally famous Andrew Ross). He has just brought out a new "telescopic" lens, by which distant objects are reproduced of an unusually large size upon the ground glass of a camera with only a moderate extension. For example, in a photograph which we have seen, the image of a rook settling on a tree distant 100 yards from the camera, measures just 1 inch across. The extension of the camera

was in this case only 2 feet. Such a lens places a new power in our hands; it will be very valuable for marine work, and it will be a true "detective" lens in the sense that we shall be able to work successfully at considerable and unsuspected distances from places or persons whose likeness we wish to secure without going through the ceremony of "asking leave." A Frenchman has attempted to achieve a similar result by fixing a short telescope in front of the camera lens, but the necessary exposure is then very long. Moreover, in some specimens sent out by this Frenchman, it was evident in the pictures which he represented as having been taken of a statue from a distant point, first with and then without the aid of his telescope, that as a matter of fact the camera had been actually moved nearer to the statue in order to secure the desired effect, for the perspective of the two pictures was totally different. This was what used to be known as "cooking" or "fudging" in the schooldays of

TALBOT ARCHER.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

PHOTOGRAPHY IN NATURAL COLORS.

WHAT is the latest novelty? Undoubtedly the new photography in natural colors. It has occupied the minds of many as long as photography has been in existence, and it has been invented again and again, only to dissolve into nothing. All nations seem to rival about it. It is certain that Lippmann, in Paris, has made a great advance in this direction by fixing colored photographs. Nobody could do that before him. But the only views he took were the bright spectrum of the electric light or glasses illuminated by electric light, therefore very bright objects. Practically we have very little to do with this, and the transmission of theory into practice is at all events a colossal step. Handsome theories can easily be built up. Paper is very patient. But to actually make or produce something, that is extremely difficult.

Even ordinary black photography does not agree entirely with nature in regard to light values. The public, of course, does not observe this. Still worse does it look with color photography. But let us be sincere. Things have to be made so that the public can comprehend them. The color sensibility plays a part. But it is a chapter about which scientists know very little and the public nothing at all. The latter follows its instinct and is guided by whatever is fashionable.

I have a picture of the celebrated Hildebrand, with a snow surface in the foreground. It appears entirely white. By looking at the snow without paying attention to the rest of the picture, the color of the former will appear quite blue.

The problem of photography in natural colors has been tried to be solved in two different ways. 1. By direct production of a finished picture after a colored original by the action of light upon a film, which reproduced the colored light in the same color. A transparent colored picture was copied, for instance, upon a film of chloride of silver, which had become brown by exposure to light. Seebeck, Poitevin, Niepce de St. Victor, Becquerel, Zenker, Verres, worked in this direction. Zenker was the first to prove, in 1867, that the colors in these pictures are produced by "stationary waves."* The pictures

* England claims the honor for Lord Rayleigh. But he did not make known this theory before August, 1887, in the *Philosophical Magazine*.

are destroyed by fixing soda, because it separates powdered silver from the chloride of silver, which settles between the layers formed by the light which produce the "stationary waves," and prevents thereby the formation of interference colors. The colors of this kind of photography in "natural" colors are therefore interference colors.

In the spectrum of Lippmann, which was exhibited in Berlin in different societies, the orange had quite a rose tone, nothing of the characteristic minium red, aside from other small deviations which theoretically can be explained. With regard to the natural resemblance of the colors produced upon brown chloride of silver paper, we have expressed ourselves about Verres in 1890. Of all colors of the originals only the red was reproduced distinctly, but it was not "natural"; it appeared copper-red, while the original color was carmine; the blue appeared as an unnatural light blue, the yellow appeared grayish red, and the reproduction of the yellow-brown was red.

The similarity to nature of this kind of photography in natural colors is therefore not very encouraging.

It has been tried now to approach the great problem in quite a different manner, by way of color printing.

Already, in 1865, Baron Ransonnet, in Austria (and independent of him, in the same year, Collen in England), expressed the idea to produce colored photo-lithographs. Ransonnet was to take three views from the same colored object, one through a red, the second through a blue, and the third through a yellow glass, which he intended to copy upon stone in the photo-lithographic manner. The result would then be three stones from which to print, where only the red rays had acted upon the first, only the yellow rays upon the second, and the blue rays only upon the third stone, and which with properly selected colors, after the manner of color printing, printed on the same sheet one upon another, were to furnish photographs in natural colors. Cros and Ducos du Hauron, Paris, supported the same principle in 1869.

The practical execution of this failed from the fact that there was no photographic film which for yellow and red was sufficiently sensitive. Such could only be produced first after the discovery of the color sensitive process by the writer. This was the eosin, tried by Waterhouse, which was also tried by Cros and Ducos in the execution of their color photography. The next to follow them was Albert, sen., photographer in Munich, who introduced the lichtdruck into the process, and obtained very interesting results in 1876.

The said photographic color print process requires properly three negative plates: one, in which all tones have acted without red, because this is furnished by the lichtdruck plate for red; a second, in which all tones have acted without blue, this being furnished by the lichtdruck plate for blue; and finally one, in which all tones have acted without yellow, which is furnished by the lichtdruck plate for yellow. The principle will at once be understood, if the ordinary black photography is called to mind. This demands a negative, in which all tones have acted without black, and such negative furnishes, printed in black, a correct positive picture. But the great evil of this genial process was the selection of the print colors, red, yellow and blue. Which red, which blue and which yellow was to be taken was left to the choice of the printer.* He selected

*The proposition of Ducos to take the "complementary color" to the applied ray-filter, was proven by Vogel in 1885 as entirely untenable. One and the same spectral color can have 2, 3, 4 or 5 complementary colors.

the one that was most convenient to him, and a resemblance to nature remained therefore out of question. The results were a striking proof of it. Albert published a piece of colored calico in this "heliochromic" process. It was much admired, because the original was not there to be compared; a comparison of the latter with the print gave the color-differences very distinctly. No color agreed with the natural color. But the reason for these deviations was not in the discretionary selection of the print colors, but in the light sensitive material. As such Ducos applied exclusively eosin collodion, which is essentially green-yellow sensitive, however much less blue sensitive and quite weakly red sensitive. Justice could not be done herewith to the principle described, even by application of so-called ray filters—that is blue, red and yellow glasses, through which the originals were taken. These defects were already recognized by the writer in 1885, who published an improved heliochromic process. This consists of:

First.—That in place of a single optical sensitizer (as with Ducos) several are applied, and each by itself in a separate plate; as for instance a sensitizer for red, one for yellow, one for green, one for blue-green (none is necessary for blue, bromide of silver being blue sensitive).*

Second.—That the optical sensitizers form at the same time the print color for the plates gained thereby, or, if the sensitizers themselves cannot serve as print color, that a similar one is taken which resembles them spectroscopically as much as possible. The latter condition will be comprehended, if it is considered that the print color has to reflect the color rays which are not absorbed from the relative color sensitive plate, or reversed, does not absorb the colors which are absorbed by the color toned plate.

This process has not remained simply a proposition as so many others, but was practically tested by Mr. Ulrich, who obtained successful results, which were shown at the exhibition in Berlin, September, 1890, at the "Verein zur Forderung der Photographie," and the German Exhibition in London, where they found undivided recognition.

Later on Mr. Ives adopted the same ideas relative to the use of those negatives for color printing, although, as I believe, a little too late. He has published a very interesting article in the January number of the Franklin Institute, but which contains a good many errors. He operates these with the old color theory of Young-Helmholtz and the so-called complementary colors—all ideas of the old school. He says: In 1885 Dr. Vogel published a plan which is a modification of Poirée's. Like Poirée, he proposed to make a separate negative for each spectrum-region, but instead of using plates sensitive to all colors, and exposing through selective color screens, Vogel proposed to sensitize a plate specially for each spectrum-region, which would amount to the same thing, and instead of projecting the pictures with colored light, he proposed to make as many pigment prints as negatives, each in color complementary to the light, which acted to produce the respective negative and to superpose them as in the Collen's method (Collen publishes simultaneously with Ransonnet the idea of the photo-chrome prints in the *British Journal*, October 27th). There are no known dyes with which this plan could be carried out, and even if there were it is, I believe, too complicated to be practicable.

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* Five years later Ives introduced an analogous principle, whereby his ideas were at first directed to lantern representations only. This was patented February 7, 1890.

I see from this that Mr. Ives has absolutely misunderstood my publication. He calls my plan, like Poirée's, a plan based upon the action of optical sensitizers, to place it parallel with another one from a time when optical sensitizers were not known.

And now even the complementary colors which, according to Ives, I am said to have proposed, and which I intentionally pass over in silence.

It is sufficient to point to the fact, as proven by me, that the designation "complementary colors" is very unsettled, and that even one and the same color can have different complementary colors.

With pleasure I leave the honor to Mr. Ives as being the first who thought about projections with colored light, but about pigment prints, as he says, I have mentioned no syllable, and, on the contrary, have remarked that I continue building upon Albert's lichtdruck. Nothing is clearer than my principle. The optical sensitizer or a spectroscopically analogous color is the print-color. This is the foundation of my natural-color printing process which was published in 1885.

Berlin, October, 1891.

[*From Photographische Nachrichten.*]

PARA-AMIDOPHENOL AND BROMIDE PAPER.

BY F. STOLZE.

We possess a great number of developers which are more or less employed for all negative plates. In England the old pyrogallol developer is predominating, but on the Continent this has been almost entirely surpassed by the iron developer, and is applied only here and there in special cases. The more recent developers, hydroquinone and eikonogen, are also much in favor, particularly in amateur circles, and although they have not yet gained the supremacy, they are at least dangerous competitors to the iron developer. Hydroxylamine and pyrocatechin have not been able to gain a good footing; the former on account of the formation of bubbles, the latter on account of its high price.

But if we turn now to the positive process, the situation will change entirely. The qualifications required here differ so much from those of the negative process that this is not to be wondered at. The film must be free from the slightest coloration as well as any trace of silver-fog. And a further condition is, that the silver precipitate which forms gives not only a brilliant black in the transparency, but also in the surface view. By the first requirement every pyro developer is naturally excluded, and even hydroquinone will not satisfy the same, having a great tendency to yellow fog in slow development. For the second requirement, on the contrary, it is highly adaptable, furnishing extremely brilliant depths.

A really dangerous rival of the iron for bromide of silver paper only was eikonogen, and it might actually have displaced the same if its high price—on account of the proportionately great concentration of the solution—had not been an obstruction. It costs about twice as much as iron, and finds, therefore, only suitable application for the smaller sizes.

Now another new developer has made its appearance, which, like eikonogen, has been discovered by Dr. Andresen, and claims the attention of the photographic fraternity. It is the para-amidophenol, which, by its discoverer, was first applied in form of the chloride and then the sulphate. After Dr. Andresen's

application for patents in the different countries, the Lumiere Bros. particularly have occupied themselves with investigations about the same and have published the results. Being surprised at the proportionately small quantity of para-amidophenol as given by the inventor in his formula, and the Lumiere Bros. mentioning particularly that this developer produces no product coloring the film during oxidation, I deemed it advisable to try the new material for the development of bromide of silver paper, for which it seemed to have particularly favorable properties. Before going into particulars, I have to recall the formula as published. Everything else will then readily be understood.

The Lumiere Bros., calling attention to the weak solubility of the para-amidophenol in water, give the following prescriptions :

I.

Sulphite of soda	200 grams.
Carbonate of soda	100 "
Para-amidophenol	12 "
Water	1,000 c.c.

Or still better:

II.

Sulphite of soda	200 grams.
Carbonate of lithia	12 "
Para-amidophenol	12 "
Water	1,000 c.c.

Dr. Andresen's formula is

III.

Para-amidophenol chloride	5 grams.
Sulphite of soda	50 "
Potash carbonate	25 "
Water	1,000 c.c.

Or :

IV.—Stock Solution.

Metabisulphite of potassa, dissolved first	30 grams.
Para-amidophenol chloride	10 "
Boiling water	100 c.c.

To a quantity of this durable solution add concentrated caustic soda solution, understirring until the precipitate which has formed is dissolved again, and then the clear solution is diluted with from five to fifty times its quantity of water, according to the developer being required of more or less strength.

Considering these four formulas, it will be found that I and II contain 12 of para-amidophenol to 1,000 of water, that is about the same proportions as used for eikonogen ; but in formula III the proportion is 5 to 1,000, therefore more favorable by more than one-half. The next question is : is the formula of Dr. Andresen sufficient for the development of bromide of silver paper or is it necessary to take concentration I and II to avoid a too slow development?

Using bromide of silver paper of my own preparation for the test, the result was, that developer III not only does develop sufficiently quick, but that it is even the most rapid of all known developers for bromide of silver paper. Oxalate of iron, with fixing soda addition, which develops about as quick, cannot be applied for bromide of silver paper, because the white parts will suffer, and the rapid hydroquinone developer attacks paper and film so much that it cannot be

used. The para-amidophenol developer No. III works so rapidly that for pictures of larger size it is advisable to dilute the same, if the development has to be watched.

It can be diluted to double the quantity, therefore, a proportion of 5 : 2,000, which corresponds about with that used for pyro. On the other hand, it may be remarked that the developer, in spite of its great working rapidity, will not bring out as much as oxalate of iron, if the quantity of the alkali is not considerably increased, perhaps from 25 to 30 per cent. But if this is done, a picture will be obtained which differs greatly from the one developed with iron. It shows a clearness of the white parts, a sparkling of the high lights, a velvet-like blackness of the shadows, which leaves everything behind that I have ever seen upon bromide of silver paper. And the principal thing : This brilliancy is not only visible in a moist condition, but keeps after drying. While hereby the deep shadows generally sink in and can be brought out again only by retouching, they remain in this instance perfect. One has almost the impression, as if the extreme rapidity of development is the cause of this, by keeping the picture on the surface, owing to the properties of the developer. Everybody knows of what an injurious influence strong addition of bromide of potassium and the artificial retarding produced by the same has upon the tone of the picture and particularly the clearness of the depths. But no matter how that may be, the fact is settled that para-amidophenol gives to pictures a wonderful enamel based upon the clearness of lights and shadows with most delicate gradations.

So much for developer No. III. I pass now to No. IV, which, according to my experience, will solve the problem which so far seemed impossible—I mean the problem of offering a ready developer in highly concentrated form. That this agrees with the foregoing case is clear, because, if the solution mixed with caustic soda is diluted fifty times a developer will be obtained of almost the same strength as No. III. A stock solution of 100 c.c. furnishes, therefore, more than 5 liters of a ready developer.

Para-amidophenol surpasses, therefore, eikonogen and the hydroquinone, and particularly the oxalate of iron, which do not admit the making of such concentrated solutions, but permit in general only a dilution to twice the volume, as it is even admissible for para-amidophenol, so that the dilution in developer No. IV can be one hundred times.

I will show now by an example how very important a process is with such a concentrated developer in the positive process with bromide of silver paper. To make enlargements of 90 x 120, about 6 liters of diluted oxalate developer are required, which I make by adding to 3 liters saturated oxalate of potassium solution 600 c.c. saturated sulphate of iron solution and 2.4 liters of distilled water.

For the development of a sheet there should, therefore, be on hand almost 4 liters of solution, to which should be added 2.4 liters of distilled water. For the diluted para-amidophenol developer 60 c.c. stock solution, diluted with about 6 liters of ordinary running water are fully sufficient; and while with iron for a number of enlargements of larger size a quantity of large bottles with stock solutions and distilled water are required, a small stock bottle alone is sufficient here. In comparison with the iron developer it may be particularly mentioned that a washing with acidified water is unnecessary.

It might be asserted here that the caustic soda solution is also required. It

plays, however, an insignificant part, as only about a fifth of the para-amidophenol solution is the same. But this is, according to my tests, not exactly necessary. I have had since fourteen days, in a well-corked bottle, a stock solution mixed with caustic soda, which is to be diluted directly with water. The upper portion of the liquor colors, of course, brownish by absorption of the oxygen in the atmosphere over it, but considering the great concentration of the solution this is not material, the brown coloration being so small that it disappears again entirely when diluted. The stock bottle of Dr. Dubois Reymond would be very suitable for the saturated solution, as this excludes also the brown coloration.

I believe that the advantages of this new developer, particularly for bromide of silver gelatine paper, are so striking that it requires no further comment. The tests with regard to negative plates have not proceeded so far that I could write about the same. As soon as finished they will be published.

The para-amidophenol is not in the market yet, but it is to be hoped that the patentee will do his best for a speedy introduction, that it may become of general use.

TONING AND INTENSIFYING BY URANIUM SALTS.

BY DR. CHARLES EHRMANN.

[Read before the Society of Amateur Photographers of New York.]

THE method to color or to intensify negatives by means of uranium salts is by no means a novelty in photography. It was practiced in the earliest times of the collodion process, according to a formula by Selle, who prescribed a solution of 10 grams each of ferricyanide of potassium and uranyl nitrate in 100 c.c. of water.

After the collodion had been superseded by gelatine emulsion plates, Dr. Joseph Maria Eder revived Selle's process, modifying it to some extent, and we find it described in detail on page 82 of his book, "Modern Dry Plates," translated by Baden-Pritchard in 1881. Soon after its publication T. C. Roche and Charles Ehrmann exhibited uranium intensified positives and negatives before the Association of Operative Photographers in New York, and ever since gelatine positives and negatives, and later bromide prints and bromide transfers, have been toned or intensified in this manner.

Let us look superficially at the chemical process taking place when toning in this manner, with especial regard to the alleged improvement of it, and the perfect preservation of the whites in the high lights.

Uranyl salts are not precipitated by ferricyanide of potassium, the so-called red prussiate, but ferrocyanide of potassium, the yellow prussiate, does so. When ferricyanide of potassium comes into contact with the silver deposit of either negative or positive, the conditions of the two substances are changed, the ferric salt is reduced to the ferrous state, and a portion of the metallic silver is formed into ferrocyanide of silver. Then only an action of uranyl nitrate becomes possible, and in combining with the reduced, the ferrocyanide of potassium, the reddish brown precipitate we desire to obtain, the ferrocyanide of uranium, begins to form. The longer the silver deposit is subjected to the action of the solution, and the more concentrated this latter is, the more intense in color will be the deposit.

Before reducing takes place the not yet decomposed ferricyanide and the

uranyl nitrate have ample opportunity to permeate the soft and porous gelatine film. It is one of the properties of the férricyanide of potassium to harden or to tan gelatine; a consequence of which is that the decomposition products, as well as undecomposed portions of the salts, are closely enveloped within the film not removable by washing in pure water. The white of a positive impression remains yellow notwithstanding all means employed to prevent it.

But the prints we have seen, which were made before us, can justly boast of perfectly pure whites without any tinge of yellow in the lights, and we are told the addition of acetic acid has wrought this wonderful and very interesting fact.

The making of uranium toned prints with pure whites is also nothing new. It is not an American invention, as has been publicly announced, I believe, and in fact we find the process described in all newer handbooks of photography. A formula for it by Dr. E. Vogel appeared first in *Photographische Mittheilungen*. It is as follows:

Red prussiate solution, 2:100	50 c.c.
Uranyl nitrate solution, 1:100	50 "
Glacial acetic acid	12 "

How simple the toning is will be at once understood, and I cannot possibly imagine why so much noise has been made about it. We all know the properties of the chemicals we work with, and those that do not ought to. We knew all along of the tanning properties of ferricyanide of potassium, and those of acids to soften gelatine or destroy its viscosity, and the application of the one to counteract the other is the only thing creditable that I can see.

Photographic and photo chemical novelties are floating in the atmosphere, as it were, waiting to be picked up by the first comer, as has been said by an old practitioner, and he is right in every sense of the word.

The method of toning and intensifying with uranyl nitrate can be very profitably employed in the making of transparencies for decorative work and for projection. An underdeveloped gelatine lantern slide may be intensified with it to perfection, gaining at the same time an agreeable and warmer tone. Failures in lantern slide making are almost entirely out of the question when we press the red prussiate into our service. Underdeveloped slides we intensify by the method described, and over-exposed and overdeveloped plates subjected to a process which I will describe on some other occasion, may be made into beautifully clear and detailed slides by applying Farmer's solution.

Let us now throw a glance at the process of intensifying negatives with uranyl nitrate, not applicable to all cases of improving feeble negatives, but eminently so to some. Under-exposed and underdeveloped negatives, unfit to print from on account of harshness in some and weakness in other parts, may be made excellent printers with the uranium intensifier as long as the negative is free from fog and perfectly clear in the non-exposed portions of it. Of course we must dispense in this case with the acetic acid. What is deleterious to the toning of a bromide print becomes here an important factor. The yellow tone assumed by the clear parts of the negative retards the too forcible printing of the shadows and establishes a harmony between light and shades not attainable with mercurial intensifiers on negatives of the described character. The manipulation requires a little more than ordinary attention, but there is the one consolation in case failures occur that the whole uranium deposit can be removed by a weak solution

of cyanide of potassium, and, after washing the plate, a new intensification be undertaken.

Uranium intensified positives may be rendered blue by immersing the plate in a solution of ferrous sulphate, also a method of considerable age, but deserving the attention of our diligent amateurs.

EXHIBITION OF PHOTOGRAPHS AT THE AMERICAN INSTITUTE.

SECOND NOTICE.

In our last issue we had to stop at the beginning of our notes on amateur exhibits. And even now we can give but a very brief review of this uncommonly interesting display.

Robert L. Bracklow has a large series of pictures of old houses in and around New York, as well as in other places, made famous by authors and events in American history. These are very interesting to all lovers of relics.

An excellent bromide enlargement by L. T. Brush is from a negative of two newsboys in City Hall Park.

Two other bromide enlargements by T. J. Burton show some fine composition in the pictures of sailors in boats, entitled "Hard-a-Port" and "In the Great South Bay."

Miss Emilie V. Clarkson has four gems in platinotypes, entitled "In Nature's Mirror," a young girl admiring her reflection in the water by a grassy bank; "Day Dreams," a girl meditating in a shady nook, with cool foliage for a background; "The Milk-Maid," a rustic study beside a wooden gateway; and "The Gamesters," two male figures in olden-time cavalier costume, playing cards. All these pictures are well thought out and nicely executed, artistically as well as from a photographic point of view.

Haywarde S. Cozzens has a frame of fine work, much of which is of a truly artistic character. "Hard Aground," on Echo Lake, N. H., is a gem.

George R. Cromwell has some very clever double portraits of the same individual in apposition, which are very perfectly matched.

C. H. Davis has one of the best frames in the exhibition, containing a number of his well known studies. That they are artistic is to be expected; but they are also well worthy of close attention as examples of painstaking work in photographic lighting and posing. We can only find space to mention a few of the most striking pictures, and those that impressed us as being a little more effective in the treatment of the subjects than the rest. "A Portrait Study," marked "h," is a fine piece of lighting with a very graceful disposition of the hands. A "Study in Posing" is one of the most perfect pieces of figure photography that we have seen for some time. The lines of this figure are uncommonly artistic and harmonious. "Portrait Without Skylight" is an excellent example of work done without the facilities of a studio. "A Pensive Moment," "Ah, There!" and "A Jolly Girl," are also gems of artistic photography.

H. M. Grisdale had a number of fine views. Among many that pleased us we noted three particularly fine ones in "After the Storm," "Delaware River, Dingman's Ferry," and "Study in Clouds." These were in platinum and plain paper prints, and proved very effective as pictures.

The views of W. F. Hapgood were very artistic, especially those on the Bronx River and of the Ducal Palace in Venice.

Charles Wager Hull, the energetic Superintendent of the American Institute, had a large and uncommonly fine collection of prints of a great variety of subjects. Among so many that were good it is difficult to mention the best; but in yachting pictures there were a number of the highest quality, in many of which the judicious use of the vignette added very much to their beauty. The collection is well worthy of close attention.

Dr. L. H. Laudy exhibits a number of his fine photomicrographs, and as usual they are well done and interesting. Diatoms, mosquitoes, blood, wood sections, pine needles, tongue of bee and kindred subjects make up three frames of wonders revealed by the microscope and camera.

Edward Leaming had a very good collection of pictures, but two of them were of more than ordinary merit. A study from life of a Moorish girl with a black background was very soft, and showed some excellent work in photographing drapery, while a study of Mary Stuart, also from a live model, was an unusually artistic effort.

Two gems in the collection of Hugo Mack were "Landscape, a Siamese Twin," a picture of the trunks of a pair of hickories rising from the same root, and "Landscape, the Newark," a charming view of the ironclad at anchor in New York Bay. The latter was a fine piece of platinotype printing.

Dr. John T. Nagle had a large collection of instantaneous views from Southwest Texas that gave a very vivid idea of the life of the ranchmen of that section, and also of the Missions founded by the early Spanish settlers. The same exhibitor also had a series of Eastern views along the New Jersey coast, in a number of which we noted some fine cloud effects.

J. Obermeyer had a very good exhibit of studies, one of the best of which had the title "Getting Ready for the Holiday," and represented a poor girl fixing her dress in anticipation of an outing. The picture tells the story, and is a good genre study.

A very interesting collection of pictures was exhibited by Ferdinand Ruppert, showing views in the old German town of Waechtersbach; also some excellent surf pictures along the Massachusetts coast. A study by the same exhibitor, entitled "All the Comforts of Home," was an uncommonly good view of a darkey interior, the inmates being around a cook stove with its homely pots and pans, the colored children listening to the strains of an accordion in the hands of the head of the house, while the wife is intent on the preparation of the meal. The genre effect is fine and the whole picture is a capital study.

A. L. Simpson had a large collection of prints, and all of a good quality. The yacht views were fine and the studies were also good, especially those entitled "Two Cherubs," a couple of little girls under an umbrella, which was a neat shot, and "Animal Study," a picture of some sheep in which the contrast of light and shade was very finely caught.

One of the most remarkable pictures in the whole exhibition was in the collection of James H. Stebbins, Jr. This was a bromide enlargement of "Sunset in Mid-Ocean," one of the finest and most uncommon pictures of cloud effects that we have ever seen. The sun behind a cloud sends down diverging rays to the ocean surface, an effect often seen by the eye, but exceedingly difficult to catch in an instantaneous picture. We must congratulate Mr. Stebbins on his

good fortune and skill in producing this handsome enlargement of so rare an atmospheric effect in a photographic negative. Another pretty idea in this exhibit was a blue-print transparency, "Sunset on the St. Lawrence River." His hand camera studies were also interesting.

Mr. Alfred Stieglitz had such an excellent collection of studies that it is difficult to select any that are superior. Several interested us more than others. "Little Innocence" was very fine, and "Returned" was a very perfect picture. Two studies of heads, one out-of-doors, were particularly fine.

A number of fine studies of Catskill scenery were exhibited by Cornelius Van Brunt, and proved interesting to those familiar with that picturesque region. The mist effects in these are very finely caught.

Some of the best flash-light effects with interiors were found in the exhibit of Fred Vilmar. In these pictures the details of drapery and decorations were excellent.

Mr. G. W. Wundrum showed a number of his well known hand camera studies, all of which were well done, both in the negatives and prints, each the work of the exhibitor.

A large collection of Obernetter prints from negatives by Daniel K. Young were very good as far as the camera work was concerned, but the prints were hardly a success. Some of the subjects were gems of scenery, as, for instance, the instantaneous view of the American Fall at Niagara and the Natural Bridge, Virginia. A fine study was also shown in the picture "An Adirondack Inspiration," a group of ferns and water lilies.

The photographs of fruits and foliage by Edward H. Lincoln were fine pieces of work and deserve the highest praise. Roses, gladioli, lilies and grapes were particularly fine.

The series of photographs of old and historic buildings by various members of the Society of Amateur Photographers, notably Messrs. Leaming, Lawrence and Duffield, were very interesting and attracted many observers. We hope these will be put into some more permanent form of print than albumen. They will become more and more valuable as time and the spirit of progress make the originals things of the past.

Another interesting collection was the pictures of E. S. Bennett of the interiors of the studios of well known artists, in many cases with the artists themselves at their work. In the latter case the portraits were very good and characteristic.

The photo-mechanical processes were represented by the fine work of the Photogravure Company, with their examples of book illustrations, and by the Photo-Chrome Company, showing color printing as applied with the type block for the printing press. Both exhibits deserve careful study.

Another application of the photographic process was well illustrated in the beautiful photo-ceramics in the exhibit of George G. Rockwood, where portraits in burnt-in enamels formed the decorations of porcelain plates, vases, watch dials and other objects, all indelibly impressed by the aid of the fire and preserving the fine character of the originals.

We close our review of this excellent exhibition of the American Institute with the hope that the new departure will be repeated next year.

The loss of a single letter makes many a broker merely broke.

COLLODIO-CHLORIDE AND GELATINO-CHLORIDE PAPERS.

BY F. J. HARRISON.

For the past year or so the heart of the amateur has been made glad. Before that time ready sensitized paper was practically the only printing material readily procurable. True ferroprussiate paper was at hand, but what amateur is there but regards the humble blue print with something akin to contempt? It was his first friend, but the friendship was sweet and short.

In using ready sensitized albumen paper the amateur is able to nearly realize his desires, but fume he ever so well, he finds his prints lacking in depth and brilliancy. Then the uncertainty as to the permanency, the long time—some twenty minutes or so—required for fuming, the prevalence of stains, blisters and the like, all combine to make this final process one to be dreaded.

Then came into the market the gelatino-chloride paper, known under the name of aristotype paper, and now, forging its way to the front here in the East, comes the collodio-chloride "aristo" paper, which has already made for itself a solid reputation out West.

In the gelatine aristotype paper the printing amateur found something which at first filled his soul with delight. No trouble in preparing, no fuming necessary and almost any range of tone of splendid brilliancy at his command with the use of practically any toning bath. His work was reduced to a minimum and the results apparently of the highest quality. All that was necessary was to print, pour on the combined toning and fixing bath, rock the tray until the desired tone was reached, wash and then—then the trouble began. Mount! How easily the word sounded, but how difficult the accomplishment. Nothing spoils a print so much as poor mounting, and with this paper the gelatine surface, softened by the water, adhered to everything in the shape of blotters. Perhaps our amateur squeezed his print upon a ferrotype plate or glass, and no doubt was astounded and pleased beyond expression at the high finish thus produced. But mounting this print neatly and preserving the gloss was another thing, and in the majority of cases proved to be an absolute impossibility. And when the print is mounted, what then? A slow but sure yellowing of the whites sets in almost invariably. An amateur's prints, too, come in for a very large amount of handling, and the impress left upon the prints by damp fingers greatly mars the beauty of the surface. In short, as a satisfactory printing material gelatino-chloride paper leaves much to be desired.

To meet the general want the following requirements must be filled, and that satisfactorily:

First.—The paper must keep for a reasonable length of time, must be free from blemish and be ready for use.

Second.—It must print rapidly.

Third.—It must tone easily and give warm rich tones.

Fourth.—It must be paper that can be readily handled before and after completion without detriment to its surface.

Fifth.—It must be permanent.

Is there such a paper? To those whose ideas as to the necessary requirements for a printing material coincide with the five stated above, I would say, try collodio-chloride or "aristo" paper. Here is a material which, when fixed and

washed, is absolutely unalterable. The support for the sensitive silver salts is not a substance which readily attracts water like gelatine, but is collodion. It is collodio-chloride paper as distinguished from gelatino-chloride paper, and while it possesses all the good qualities of this latter it has none of the bad ones.

The method of preparing collodio-chloride paper may be found in many works on photography, but the amateur is by no means in a position to make paper that will rival that now on the market. Buy a package of American aristo paper, take out a sheet and examine it. Notice the firm even surface and the absolute freedom from spots or markings. Then read the instructions and go ahead. If you are working on a large scale, and desire uniformity of tone throughout the whole batch of prints, tone and fix separately. But the ordinary amateur is by no means in favor of a multitude of processes, and to him we would recommend the combined toning and fixing bath.

In developing your plates remember you have to make prints from them. Give full time, use weak developer, and aim for a negative of not much density, but full of detail. Varnish this negative with any good varnish and print. Do not be guided by the shadows, which will probably bronze over a little, but get out all the detail in the high lights. Speaking generally, the printing should be carried a little further than is usual with albumen paper.

The printing finished, take a shallow dish, pour in water sufficient to just cover the bottom, and lay the prints face down, pressing them down to keep them flat. Rinse in two changes of water and drain. Now pour on a solution of 3 parts 95 per cent. alcohol and 1 of water, and let them lay in this for five to ten minutes, according to the age of the paper, the date of manufacture being stamped on every package. This softens the surface somewhat, removes all tendency to curl and renders the toning more equable. Save this softening solution for future use, and wash the prints until water is no longer repelled from their surfaces. Now tone, either in the combined toning and fixing solution or in any good toning bath. If the latter is used, fix for twenty minutes in hypo 1 part to water 20 parts. Wash for an hour and mount at once, using preferably equal parts of corn starch and flour as a mountant.

Or squeegee onto a ferrotype plate, and obtain the glacé finish. If you have a burnisher get it thoroughly hot and burnish without lubricating the prints.

You have now a print which is not altered by light, air or moisture. The first two can only be tested by time, but if the print is fixed properly light will not affect it, and if moisture is inert then the chances are that the air will not do any damage. To test for moisture, drop some ink upon the burnished print, now wash with water, rub well with a soft cloth, and the original finish will still be there, neither the ink nor water having produced any impression upon the surface. This property may be applied for the removal of dirt, fly specks, and other marring media.

In this collodio-chloride paper we have a material excellent for both professional and amateur. To the professional it means the banishment of the silvering and fuming rooms, a constant supply of paper that will keep, and the production of prints that are of a brilliancy of tone and finish unattainable on any other paper.

To the amateur it is only necessary to say, "If you desire a paper giving the best possible and most permanent results with the greatest certainty and

the least trouble, give the American aristo collodio-chloride paper a trial, and produce prints that are a credit to your negatives and to yourself and a delight to your long-suffering friends.

PHOTOGRAPHIC CHEMISTRY.

BY R. MELDOLA, F.R.S., *Cantor Lectures at Society of Arts.*

(*Continued.*)

IN the same way that the compounds of silver are prepared and studied, the other photographic materials should be dealt with. Their ordinary chemical properties should be familiar to the student, not only through reading or attending lectures, but by laboratory work. His knowledge should be as wide as possible, and should embrace the compounds of iron, chromium, manganese, uranium, copper, mercury, platinum—in short, of all the metals having any connection with photography, and, it is hardly necessary to add, that the special uses of any of these compounds in photographic processes should be dwelt upon exhaustively. To this knowledge it is desirable to add an acquaintance with the formula and mode of preparation of the reducing agents, both inorganic and organic, used for development, such, *e.g.*, as hydroxylamine, pyrogallol, hydroquinone, eikonogen, and so forth.

Armed with this general chemical knowledge, specialized in the direction of his subject, the students will be in a position to proceed to the particular kinds of decomposition, viz., photo-chemical, upon which the art of photography is based. This part of the subject must also be dealt with as broadly as possible, for it is of the utmost importance that the principle should be realized that the photo-chemical decompositions made use of in photography are but particular instances of a general class of such decompositions, some of which are at present not available for photographic purposes. It must be pointed out that a study of some of these collateral decompositions is likely in the future to lead to results of practical value, and may certainly be expected to throw great light on the nature of the photographic image.

The broad distinction between purely physical changes induced by light and actual photo-chemical decomposition may be maintained, although it is often difficult to refer a particular case to one or the other of these classes. Complete lists of all the known instances of the physical and chemical action of light will be found in the works of Eder and Vogel,* but it is advisable in treating the subject as a branch of chemical technology not to bewilder the student at first with a vast array of facts, but rather to enforce general principles by a few well chosen illustrations, which the student can work out for himself without much difficulty. The simplest kind of photo-physical action is that which produces a change in molecular structure, either temporary or permanent. In connection with this, the action of light upon selenium is perhaps the most striking illustration that can be given ; and where the necessary apparatus is at hand, it would be well to demonstrate experimentally in the usual way. As examples of permanent change of molecular structure, the modifications in crystalline form undergone by certain substances on exposure to light may be appealed to and illustrated. The following experiments can be easily done in the laboratory:

1. A saturated solution of sulphur in carbon disulphide is prepared, and two or three tubes are filled with the solution and sealed up. The contents of a tube kept in the dark will remain clear for an indefinite time, but on exposing one of the tubes to sunlight, the contents become turbid, and a gradual separation of insoluble sulphur crystals will take place.

2. A plate of glass is coated with a silver mirror by any of the usual methods of chemical reduction. The mirror is iodized by exposure to the vapor of iodine,† and

* *Ausfuhr. Hanb.*, part i ; Vogel's *Handb. d. Photog.*, part i.

† Such films of silver haloids on glass are very convenient for experimental purposes, as they are (when dry) absolutely free from anything that can be regarded as a sensitizer, and are therefore particularly well adapted for purposes where films of the pure haloids are required.

then exposed to bright light (electric arc or sunlight) for ten to fifteen minutes, one portion of the film being protected by a dark paper screen. The film is semi-transparent at first, but, after the experiment, it will be found that the exposed portion has become yellower and more opaque than the screened portion, the change being apparently due to a physical modification of the silver iodide.

Such experiments as these will serve to impress the mind with the fact that light can cause purely physical changes. Attention may be called to the existence of other changes of a like nature, such as those which occur in red cinnabar, in red realgar, in the crystalline form of nickel sulphate and zinc selenate, etc. From cases of this kind we are led, in the next place, to other changes, which serve to connect photo-physical with photo-chemical action, viz., photo-polymerization. The meaning of the term polymerization will be familiar to the chemical student. It must be pointed out that many of the changes in crystalline form, etc., alluded to in connection with the previous examples, may be really cases of photo-polymerization or depolymerization. Then the known cases of the polymerization of organic compounds, such as anthracene to paranthracene, styrene to metastyrene, vinyl bromide, thermoquinone to an insoluble modification,* and so forth, may be dealt with and illustrated, as far as possible, experimentally. Pointing out, by way of caution, that it is often very difficult to discriminate between photo-polymerization and photo-oxidation, the action of light upon asphalt and bituminous substances may be taken as an illustration of the difficulty in question; and a study of the action of light upon such films will naturally lead to the various heliographic processes based upon the original method of the elder Niepce. How far it is desirable to lead the worker in this direction from the practical side must, of course, be determined by circumstances.

The action of light upon asphalt and similar substances is not only of practical importance, but its scientific aspect is worthy of the most serious attention, both by the student and the investigator, who, after all, is himself only a student at a somewhat more advanced stage of his studies. There is some doubt at present whether the insoluble asphalt result from the action of light is a polymeride, or whether it is a product of photo-chemical oxidation. According to some authorities, the change does not take place in a vacuum, neither in nitrogen nor in hydrogen. On the other hand, it is stated by Kayser, in favor of the polymerization theory, that no increase of weight occurs in the film, that the insoluble asphalt is converted into the soluble form again by fusion, and that a solution of asphalt in a closed vessel also deposits the insoluble modification on exposure to light. The decision of this point rests with future investigators, but certain facts have been discovered with respect to the constituents of asphalt which must be emphasized in connection with photographic chemistry. It has been found that Syrian and Trinidad asphalt contain a small quantity (4 to 5 per cent.) of a substance soluble in alcohol and insensitive to light, another portion (45 to 57 per cent.) soluble in ether, and a residue insoluble in ether, varying from 52 to 58 per cent. The portions soluble in alcohol and ether, and the insoluble residue, all contain carbon, hydrogen and sulphur; and Kayser, who has investigated these compounds, has gone so far as to assign formulas to them. The portion which is soluble in ether is sensitive to light, but not so sensitive as the insoluble residue, which contains the constituent of the greatest value for the heliographic processes. The practical outcome of these investigations has been the preparation of a high-quality asphalt, consisting essentially of the portion insoluble in alcohol and ether. It may be added that the property of becoming insoluble in hydrocarbon oils on exposure to light does not appear to depend upon the constituent containing the sulphur, as some specimens of asphalt from different parts of the world, which possess the same property, have been found, on analysis, to be free from sulphur, and to consist of hydrocarbons only.

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* H. W. Vogel has obtained a positive print in thermoquinone by making use of this property. See his *Handbuch*, part i, p. 41.

Before leaving these facts concerning asphalt, I should like to point out that there is a promising line of investigation here, which would well repay a few years' patient work, even if it led to no practical result. I am inclined to believe, however, that the results would be of practical value, and especially in the direction of increasing the sensitiveness of the asphalt film. Asphalt is a complicated mixture of hydrocarbons, etc., and it is probable that the sensitiveness is due to a few or possibly to only one of its constituents. It would be worth while, therefore, to make a further series of experiments having for their object the isolation of the sensitive constituents. I need hardly pause to point out of what immense value it would be to have a bitumen film possessed of a sensitiveness approximating only to that of the silver bromide emulsion.

From these cases of photo-physical action, of polymerization, and of possible photo-chemical oxidation, the study of true photo-chemical decomposition may be taken up. On account of the comparative simplicity of their decomposition, the salts of iron lend themselves admirably for demonstration at this stage. The study of the ordinary chemical reactions of iron salts will have prepared the way. Having shown how reducing agents convert ferric into ferrous salts, let it be demonstrated experimentally that many organic compounds, such as alcohol, oxalic acid, etc., do not immediately reduce ferric salts. It must then be pointed out that these organic compounds are susceptible of oxidation by ferric salts under the influence of light—that they are, in fact, potential reducing agents. This can be done in test-tubes or flasks in the first place, and then on paper films, leading to the ordinary cyanotype and blue printing processes. A few hints for the carrying out of the experiments may be found serviceable.

1. A solution of ferric chloride (2 to 3 per cent.), mixed with a solution of oxalic acid,* will, of course, on testing with potassium ferricyanide, give no blue coloration. Some of the same solution, exposed for five minutes or so to strong light, will be found to contain ferrous salt, on again testing with ferricyanide:

$$2FeCl_3 + H_2C_2O_4 = 2FeCl_2 + 2HCl + 2CO_2.$$

2. By using ferricyanide with the ferric salt, and exposing to light, the reduction is made visible by the formation of Turnbull's blue. This can be done by adding ferricyanide to the foregoing, or preparing two solutions, one containing 8 grams of potassium ferricyanide in 50 cubic centimeters of water, and the other containing 10 grams of ammonio-ferric citrate in 50 cubic centimeters of water. The solutions are mixed before use, and then exposed to light, first in a test-tube, and then on paper coated with the solution, and allowed to dry in the dark. The practical application of this method for copying and printing will be obvious.

The chief point of general theoretical importance brought out by such experiments as these is, that light only reduces the ferric salts in the presence of oxidizable compounds of sufficient instability. It is advisable, at this stage, to introduce the notion of sensitizers, and to point out that oxalic acid, citric acid, alcohol, etc., may be regarded in this light in the experiments referred to. The demonstrations with ferric salts may, of course, be extended in many directions and made the basis of numerous practical exercises and lessons in the application of general chemical principles to special cases. All that has to be borne in mind is, that a surface of an organic salt exposed to light under a stencilled design (or a picture) gives ferrous salt on the exposed portions, leaving the unexposed portions unchanged. Various reagents may then be used to reveal the chemical difference in the two portions, the subject of photographic development being thus introduced, and the changes involved being explained by ordinary chemistry. By way of example:

1. A design printed on paper coated with ammonio-ferric citrate is developed by ferricyanide. The exposed (reduced) portions come out blue, owing to the formation of Turnbull's blue. Supposing ferrous citrate to be formed:

$$Fe''_3(C_6H_5O_7)_2 + K_6Fe_2Cy_{12} = Fe_3(Fe_2Cy_{12}) + 2\,K_3(C_6\,H_5O_7).$$

* The addition of some alcohol increases the sensitiveness of the mixture.

The blue design, after being well washed, can be made the subject of many further experiments, all instructive as illustrating chemical principles with which the student should be familiar. Thus, on treatment with a dilute solution of caustic soda, the blue is at once decomposed with the formation of Fe_3O_4, which remains on the paper. We have thus a faintly visible brownish design, which can again be developed by taking advantage of the property possessed by the oxides of iron of forming colored compounds with organic substances, such as gallic acid, alizarin, nitro-sophenols, etc.

2. The design printed on the ferric salt may be developed by taking advantage of the reducing power of the exposed (ferrous) portions and the non-reducing power of the unexposed (ferric) portion. Thus, with a solution of silver nitrate:

$$2Fe''_3(C_6H_5O_7)_2 + 6AgNO_3 = 4Fe'''(C_6H_5O_7) + 2Fe'''(NO_3)_3 + 3Ag_2.$$

With a solution of auric chloride:

$$2Fe''_3(C_6H_5O_7)_2 + 2AuCl_3 = 2Fe'''Cl_3 + 4Fe'''(C_6H_5O_7) + Au_2.$$

Similarly with platinic chloride, chromates, mercury salts, and other reducible compounds.

3. Development can only be effected by utilizing the oxidizing property of the unexposed (ferric) portion, and the non-oxidizing power of the reduced (ferrous) portion, such, *e. g.*, as by immersing in a solution of potassium iodide, mixed with starch paste.

Such demonstrations as these cannot fail to give a vivid idea of the effect of photo-chemical decomposition, and the striking results that can be obtained by the application of familiar reagents. It may be pointed out that the photo-chemical reduction of ferric salts, although practically useful for printing purposes, takes place too slowly to enable these compounds to be used at present for the production of camera pictures. But there is no reason why the rate of photo-chemical reduction—*i e.*, the sensitiveness of these compounds—should not be increased by admixture with some easily oxidizable substance and a sensitive film prepared by this means which would cheapen photographic processes by dispensing with the use of silver salts.

In the same way that the photo-chemistry of iron is studied, the other sensitive metallic compounds may be dealt with. The reduction of uranic salts, and the development of uranium prints by various reagents, will naturally be connected with the analogous ferric salts. The photo-chemical reduction of chromates in the presence of organic substances, such as gum, albumen, and gelatine, will lead to the numerous practical applications of chromated gelatine in the processes of etching, pigment printing, collotype, etc. In these processes practical instruction may be given at this stage as far as thought desirable. The salts of mercury and copper may also be studied with advantage, as illustrating the nature of photo-chemical decomposition. The well-known greenish mercurous iodide is easily prepared by decomposing freshly precipitated and washed mercurous chloride with a solution of potassium iodide. Some of this salt, washed by decantation, and exposed under water to the action of strong light, rapidly darkens, owing to the liberation of metallic mercury. According to H. W. Vogel, the decomposition may be represented by the equation—

$$3Hg_2I_2 = 2Hg + Hg_4I_6.$$

The compound Hg_4I_6 is mercuroso-mercuric iodide, Hg_2I_2, $2HgI_2$. The decomposition of mercuric chloride in the presence of ammonium oxalate is also an instructive illustration of photo-chemical decomposition, as it takes place with comparative rapidity, being the reaction made use of in Eder's chemical photometer—

$$2HgCl_2 + (NH_4)_2C_2O_4 = Hg_2Cl_2 + 2NH_4Cl + 2CO_2.$$

(*To be continued.*)

[*From the British Journal of Photography.*]

COPYING BOOK ILLUSTRATIONS AND OTHER SIMILAR SUBJECTS BY ARTIFICIAL LIGHT.—III.

BY T. N. ARMSTRONG.

In my last article I offered some suggestions anent the working up of certain kinds of cartoons or pictures by means of an ordinary lead pencil and brush charged with Indian ink. This improvement of the pictures to be copied is a very essential part of the operation we are considering, and not only is such mending applicable merely to the rougher class of illustrations so often now met with, but it may also be extended to and applied with good effect to ordinary photographs, such, for instance, as portraits in which some portions are lacking in detail. How often do we meet with such, where by an injudicious mode of lighting the sitter, one side of the head has a snowy appearance and is lacking entirely in detail. Such examples are much improved by a few judicious touches with the brush and a suitable tint of color. Dark eyebrows also can be worked up nicely where they are wanting in force and vigor, and many other little additions made to the shadows so as to bring up contrast. This working up in no way destroys the original or detracts from its value, for any touching up is very easily removed from the surface with a damp sponge or handkerchief after a satisfactory negative has been procured, when no traces of the working up will be left. When working on some classes of illustrations, of course any working up or dodging of the original would simply be absurd when such are of a class as to make the same inadmissible, such as in legal documents and cases where an absolute fac-simile is to be produced; but in a very great number of ordinary every-day subjects a little working up of the original is always appreciated, and therefore permissible, and not only does this modeling apply to the picture, but the negative itself should come in for a share of attention. It is only by attention to these by-paths in photography that really excellent productions of a kind are turned out.

Having, therefore, bestowed as much labor as possible on the picture to be copied, the next step is to endeavor to obtain as perfect a negative as possible from the same. If as it has been said that in portraiture the sheet anchor is modeling or retouching, so in the production of negatives from such subjects as are black and white, intensification is hardly less important. Of course I am referring to where the work is being undertaken with the aid of gelatino-bromide dry plates; and such plates as yield good plucky negatives only should be employed. Once an operator gets into a certain groove of working with any special developer or brand of plate it is not good form for him to begin chopping and changing about, and when he can with ease produce negatives from black and white objects that show virtually clear glass and dense blacks, so dense as when held up at a distance of about 2 feet from a gas flame the latter is just hardly visible through the dense parts, then he has overcome one of the difficult problems in photography. With some classes of plates and proper system of development, at times followed with a good smart intensification, such negatives are easily obtained. Nor is it by any one special formula that such are got. I know in my practice I work one way and my son works another, yet we somehow generally arrive at the same end. I use a soda developer, as described recently by me when writing an article on stereoscopic work, and when I have to take recourse to intensification I employ the ordinary mercuric chloride and top up with a solution of ammonia.

One very important point, however, is to look thoroughly well after the complete washing of the negative before it is attempted to intensify. When such is neglected failure in some respects is sure to follow. When working with the aid of two Argand burners, as described by me, a very few trials will suffice to enable an operator to learn what is the correct exposure for the particular class of subject and form of developer he is using. In this matter I can only say that, with my formula for development, I have to give about double the exposure that my boy gives; of course, he uses a formula of his own.

I generally take my gas from two gas jets, and this gives me a good blaze of light in the Argands, in fact, quite as much as they can take up, and when using them in this way and copying, say, a cabinet photograph, and using a plate of about nineteen on the sensitometer, with lens stopped down to *f*-11, an exposure to gaslight alone of about six minutes just suits my style of development. I rather prefer to under-expose and box well up in developing. Of course, my formula does not stain the plate, and as a rule I intensify. When developing, it is not advisable to carry the same to such an extent as causes the shadows to veil over. When all detail is out it is best to stop and get density by intensifying; by this means clear glass is more easily obtained. Of course, I am now treating of such subjects as are merely black and white. There are many other classes of subjects where the middle tints must be looked after with the utmost care, but in such subjects as printed matter, hymns, etc., the chief aim is to obtain clear glass and dense blacks, and in my opinion this is best obtained by not carrying the development too far so as to veil over the transparency of the blacks, and finally to obtain density by a good smart intensification.

In some classes of subjects I find it very useful to employ a camel-hair brush, charged with a solution of alum and hydrochloric acid, to stop development in any particular part; but of this I shall have more to say when I come to treat of the development of positives on lantern plates from negatives obtained by artificial light. A beginner must, however, pay strict attention to his exposures, and make this dovetail with the particular form of developer he is best acquainted with. It will also be found that in copying photographs a very different state of matters exists than is the case when merely copying black and white subjects, such as printed matter, etc. Here a more prolonged exposure will be found necessary, but once a beginner makes a few exposures he will soon feel his way, and hit off to a nicety the right time for the different subjects.

To my mind there is a great fascination in being able to copy by means of artificial light some of the numerous interesting book and other illustrations which are so often met with; and when lantern slides are produced from such subjects as are suitable in many ways for private exhibitions, the charm of this branch of photography is much enhanced.

(*To be continued.*)

PHOTOGRAPHIC METHODS OF OBTAINING POLYCHROMATIC IMPRESSIONS.

BY M. LÊON VIDAL.

[Read before the Photographic Society of Great Britain.]

ONE of the most interesting of questions connected with photography is that of obtaining polychromatic effects, especially now that a high degree of excellence has been obtained as regards the production of pictures in monochrome. We must say at the outset that our object is not to consider the problem of obtaining colored photographic effects direct from the colors themselves. That is a question for the future. The few investigations and discoveries which have already been made have not thrown much light upon this matter. No practical or artistic effect has been obtained which is of commercial value. We must leave it for our scientific investigators to discover a direct method of photographing in colors, and to crown their labors by putting their discoveries to some practical use.

For the present, we propose only to refer to well known methods, and make use of those pigments only which one finds ready to hand. It is only intended to call upon light to perform those functions which it can so easily carry out in the various photographic processes practiced at the present time.

A point which strikes us at the outset is the indifference of typographic and lithographic printers in general to the use of photographic methods. There are of course

exceptions, but these are rare, and we should be glad to induce a larger number of those engaged in those industries to allow that photography ought to be one of their principal auxiliaries, and to convince them that by its aid their work could be executed more cheaply, more thoroughly and more artistically.

For want of sufficient information it is still thought that photochromy presents serious difficulties, and for this reason chromo-lithographers always adhere to their routine methods of copying either from nature or from works of art. Nevertheless, as we shall presently attempt to show, orthochromatic photography has made sufficient progress for us to be able to use it readily to obtain the real values of the luminosity of different colors, and also for the separation to a certain extent of different colors.

In the first of the two methods which we shall describe, the image is copied accurately as regards light and shade by means of photography, and is then colored by means of rough tones of color laid on by chromo-lithography, the selection and combination of the colors having been done by an artist in accordance with a pattern. The photographic work is extremely simple, and consists only of the execution of one single negative. This "simple photochromy" (photochromie simple) is at times of the greatest use, and there are many circumstances under which it is amply sufficient, and it avoids the necessity of having recourse to more complicated methods.

In the second of the two methods, one selects the colors photographically in a manner analogous to that suggested by various investigators, and among others by M. Ch. Cros, M. Louis Ducos-du-Hauron, and Ives of Philadelphia. In this case, the preparation of several negatives is useful for obtaining as accurate a selection of colors as possible. We do not say that three negatives should be prepared, because it is possible that a larger number may be necessary, or on the other hand two or three may suffice. We confine ourselves to methods which are really of commercial and practical value, and we object to the dogmatic theories which lay down that with three primary colors one can reproduce all combinations of colors ; that is an ideal which no one has yet attained, either with or without the use of photography. We take this opportunity of protesting against the claim put forward by Cros and others, who have worked on similar lines, that they have succeeded even indirectly in solving the problem of photography in colors.

Their method consists simply in obtaining negatives which correspond more or less exactly with certain given colors regardless of the other colors. It is necessary, then, to find the exact tonality of the colors which are to be superimposed, and very rarely will a subject treated according to the indications of pure theory be an accurate reproduction of the original. We at any rate have never seen a successful instance.

We think, on the contrary, that a photographic selection of colors, however well it may be carried out, ought to be assisted by some retouching. This is all the easier because the whole of the design is present, the modeling is to a great extent exact, and in a word it is only necessary to make a few slight corrections on a work already nearly complete. These corrections often consist only of a few blockings out on the negative, or erasures on the printing surface.

In describing in some detail this second method, which we designate by the name "composite photochromy" (photochromie composite), we hope to explain the services which it can and ought to render to chromo-typographers and chromo-lithographers.

We omit not only the numerous varieties of photo-paintings and photo-miniatures, which are only of restricted use, but also photogravure in intaglio, which, except for maps and plans, is unsuitable for polychromatic printing. It is true that by its aid remarkably good work has been done, but it is necessary to paint on the engraved plate, copying the outlines in colors ; a delicate and lengthy operation which is necessarily expensive, and only suitable for *editions de luxe*. It is not a method easy of application, and moreover few studios are arranged in such a way as to enable it to be carried out.

Thus, to repeat in a few words the substance of this introduction, we may say that

while we are waiting for the solution of the problem of the direct reproduction in colors of polychromatic originals, there already exist two thoroughly commercial methods of combining photography with the use of colors, so as to give a result which may be as accurate as possible. One of these methods is simple photochromy, the other is composite photochromy.

We will now sketch in outline the nature of these two methods, which, it may be remarked, are by no means mutually exclusive; on the contrary, when the nature of the subject permits, they may be used simultaneously.

Simple Photochromy.—This consists, as we have said, in the preparation of one single negative, the positive print taken from which is combined with certain colors, according to the nature of the original. The negative ought evidently to be prepared with all possible accuracy as regards rendering of light and shade, and with this object it will often be necessary to use orthochromatic plates, so as to obtain the best effect.

For example, if the subject contains much red, it is necessary to use not the first isochromatic plates which one finds in the market, but plates which have been sensitized for the red rays.

As a rule, ortho or isochromatic plates, which are sensitive for yellow, are also somewhat more sensitive for green than ordinary plates, but they are absolutely insensitive to red rays.

(*To be continued.*)

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

SPECIAL NOTICE.

To Medal Winners :

The dies for the medals are almost completed, a proof having been shown me a few days since.

The work has been delayed longer than was expected, but the medals will very soon be forwarded to the respective winners.

Yours truly,

GEO. H. HASTINGS,

Prest. P. A. of A.

OUR ILLUSTRATION.

THE frontispiece of this issue of the BULLETIN gives a view seldom attempted by the photographer, for a shot with the lens pointed directly at the sun is more than likely to result in a mass of fog when the negative is developed. This view was taken by Mr. Scandlin at about six o'clock in the evening with an orthochromatic plate. We doubt if as good a result could be obtained on an ordinary plate under the same circumstances, even using a yellow screen, while in this case the exposure was made without any such precaution. The heliotype print is quite good, but does not give the full value of the negative. The latter shows much more detail in the foreground and some qualities that would come out in an "aristo" print. Unfortunately, we had only the single negative to work with, and a photo-mechanical print was all we could use to produce the illustrations for the large issue of the BULLETIN.

AN IDEAL SPOT.—"How do you like your new place, Doctor?"

"It's very nice indeed. There's been more sickness in Budville in the past week than there was in Hollowtown in a year."

ANTHONY'S
Photographic Bulletin.
EDITED BY
Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.
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SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE regular meeting of this society, held November 10th, was the scene of an animated and useful discussion. President Stebbins took the chair at 8.30, and on motion it was resolved to dispense with the regular routine business and proceed directly to the scientific part of the programme.

Mr. Stebbins stated that it had been his intention to make some remarks on para-amidophenol as compared with eikonogen and hydroquinone, but as Dr. Ehrmann had kindly volunteered to make some comments upon this subject, he would leave what he had to say until the next meeting. Dr. Ehrmann said his experiments with para-amidophenol were somewhat incomplete, owing to the difficulty of obtaining sufficient material. He read several extracts from a paper by Dr. Stolze, of Germany, and commented upon the same.

Mr. G. D. Milburn gave an interesting talk upon bromide paper, supplementing his remarks with a demonstration of the working of the process, going through the exposure, development, etc., in full view of the audience, the room of the society being admirably adapted for a public demonstration by the use of ruby incandescent lamps. The bromide prints he toned to a sepia tint, using a solution made up after the following formula:

SOLUTION I.

Red prussiate of potash....9 grains.
Glacial acetic acid........5 drams.
Water....................8 ounces.

SOLUTION II.

Uranium nitrate...........8 grains.
Water....................8 ounces.

Use equal quantities of I and II for toning.

Mr. Inglis, of Inglis & Company, of Chicago, stepped forward and claimed that his company were the originators of the sepia toning of bromide paper by means of uranium nitrate, and brought forward prints thus produced ten years ago.

Mr. Milburn, in reply, disclaimed having pretended to have been the originator, and pointed out that several times in the course of his remarks he had called attention to the fact that he was not demonstrating a new process, or one of which he was the originator, but that he had tried to prove the value of the process to all present, and thought he had done so satisfactorily.

Dr. Ehrmann's remarks on the intensifying and toning properties of uranyl salts will be found in another part of the BULLETIN.

Mr. Curtis exhibited a hand camera of the Magazine type, and this concluding the business, the meeting adjourned at 10.45.

AMERICAN INSTITUTE PHOTOGRAPHIC SECTION.

A CAPITAL programme was arranged for the regular monthly meeting of the Institute Photographic Section, it having been postponed from November 3d until the 10th, because of election day falling on the former date. Mr. Henry J. Newton occupied the chair. Mr. Mason, the Secretary for the section, announced the receipt of various photographic journals, and a vote of thanks was passed for same. For the next meeting, on December 1st, it was announced that in addition to the exhibition of new apparatus and the description of certain new processes, Mr. A. D. Fisk would entertain the section with a large quantity of excellent lantern slides, and a very cordial invitation was extended to all present and to their friends.

F. J. Harrison exhibited a Thornton-Pickard

shutter. This is on the roller-blind system, and is readily adapted to the lens. Of neat appearance, it enhances the beauty of a complete equipment, and its efficiency was apparent. A pull on a string sets the shutter, while pressure upon a pneumatic bulb releases it. Any speed may readily be obtained. The change from instantaneous to time is effected by the simple movement of a lever. The same gentleman also exhibited some fine samples of work done upon the collodio-chloride paper manufactured by the American Aristo Company of Jamestown, N. Y. This paper has a surface free from blemish, and one that when the print is finished is absolutely impervious to moisture. The result of this is that the yellowing of the whites so common with gelatino-chloride papers is an unknown quantity, and in addition the paper can be handled with impunity without detriment to its surface. The prints exhibited ranged in size from 20 x 24 to cabinets, and were the work of Straus, of Chicago.

Mr. Newton then introduced Mr. Becker to the audience as one of the oldest of the veterans in photography. Mr. Becker said he had been working at photography and photographic appliances for some thirty years, but only recently had he practiced it as a pastime. The new electric lantern having been started, Mr. Becker exhibited a quantity of slides of local subjects which proved of great interest. One, the home of the oldest yachting club, started by Commodore Stevens, was very artistic; others were views in Hoboken, one of St. Paul's Church on Hudson Street, making a very pretty picture. Others were scenes at Fort Lee, and served to remind those present that within easy reach of New York city there is most excellent food for the camera. A group of the Hoboken Camera Club completed Mr. Becker's exhibit.

Mr. Henry J. Newton had brought along a lot of slides and gave a most instructive lesson with regard to the obtaining of that aerial perspective so necessary to a good lantern slide. He said that the time has come and been here for many years when the lantern slide has become an absolute necessity to the lecturer, historian and traveler, and it has been so great a necessity that anything that will assist in the obtaining of slides absolutely representing the object they are supposed to represent is of importance. He did not think that the majority of slides did come up to this standard. From the start art had been ignored. The first slides were made by professional photographers, not by artists. Their idea had been that a slide to be perfect should be quite clear in the whites and devoid of atmosphere. As a result, upon the screen appeared flowers growing in the midst of what appeared to be snow. Mr. Newton advanced, laid down, and emphasized that aerial perspective was as essential as linear perspective.

He would not presume to tell the audience how to make such slides, but he would show what he had brought with him and describe his method for their production.

A point particularly emphasized was that any plate that will make a good negative will make a good lantern slide. By the use of quick plates he saved much time and got slides free from snow and with good atmospheric effect. Comparing the time required he stated that whereas with an Eastman lantern slide plate, an exposure of fifteen minutes had been necessary; on a Carbutt eclipse plate he had made what he thought was a better slide in twelve seconds. To substantiate his statements Mr. Newton showed on the screen a series of slides and stated the plates used. For example, a slide of the night-blooming cereus made on a Carbutt lantern slide plate was compared with a slide from the same negative made upon a Cramer and a Stanley plate, two of the most rapid plates obtainable; whereas with the slow plate a general hardness was visible, in the case of the rapid plates an excellent slide, absolutely soft and delicate, was produced. Similar examples made from negatives taken around Mr. Newton's country home demonstrated the same thing. For the production of such slides it is necessary to have everything clean. A dirty negative makes a dirty slide. A great deal too depends upon the developer. Mr. Newton stated that many years ago he recommended the use of the carbonates of the alkalies, and later he had used the caustic alkalies with such success that he had discarded other accelerators. His method he had published in the "International Annual." The slides he showed he had developed with saccharate of lime, though he claimed that any developer that will make a good negative will make a good positive. The saccharate of lime he made by dissolving about one pound of sugar in a gallon of water and pouring it little by little upon lime. This makes a very strong solution of a port wine color. The developer he made up as follows: To 3 ounces of saccharate of lime add 5 ounces of water, then 24 grains of ferrocyanide of potassium. To this add 4 grains of sodium bromide, 20

grains of sulphite to each ounce of water, and when this is dissolved add 5 grains of hydroquinone for each ounce of solution. This makes a very strong developer which will keep without decomposition. For views he used 2 grains of hydroquinone to each ounce of water. He used two or three dishes for developing and adapted the developer to the exposure. Having the plate developed, fixed and washed, he then tempered it with iodide of mercury. A solution of iodide of mercury in potassium iodide is made by adding this latter salt to bichloride of mercury until the precipitate redissolves. This solution he poured on his plates. When the proper density is reached the plate is thoroughly washed and immersed for a short time in weak hypo and again washed.

Mr. Newton's slides certainly bore evidence of careful manipulation and were excellent testimonials of the efficiency of the methods described by him.

The meeting adjourned at 10 o'clock.

SOMEBODY GOT PUT OFF.—The President of one of our large insurance companies just returned from a Western trip relates the following good story: "On the train going from Chicago to Dubuque, Ia., was a passenger in one of the sleeping cars who had been drinking heavily, but realized the fact that he was intoxicated. As he was about to retire without disrobing he called a porter to him, and handing out a dollar, requested to be waked up at Rockford, Ill., and, said he: 'Be sure and put me off, whether I want to go or not. I know I'm pretty full, and when I'm in this condition I'm likely to fight; but don't mind that, just put me off and it will be all right.'

"The colored porter promised to do so, and the man was soon asleep in his berth.

"Early next morning the train was near Dubuque and the passengers were hurriedly dressing; the colored porter was attending to his duties with his head bandaged, one eye closed and his face showing hard usage.

"Just then the Rockford passenger crawled out of his berth, looked out to get his bearings, and then went for the porter: 'Look here, you ——, what does this mean? Didn't I tell you to put me off at Rockford, you ——?'

"The darkey looked at him a moment and said: 'Is you de gemman what wanted to be put off?'

"'Yes, I'm the one, you —— ——, and I gave you a dollar to see to it!'

"'Well, if you's de gemman what give me dat dollar, what I wanter know is dis here, who was de gemman dat I put off at Rockford?'"—*New York Recorder.*

THE experiment has convinced me that I cannot get along without the BULLETIN. Enclosed find postal note for subscription.

Yours truly,

H. STEWART, JR.

I DON'T care to lose any of the BULLETIN; for it and the "Annual" are two of the best that are published.

Yours truly,

FRANK THOMAS.

I CANNOT do without the BULLETIN, as my success depends on its valuable instruction.

C. S. AUBREY.

I AM much pleased with the BULLETIN, and hope to continue receiving it.

Yours very truly,

C. R. BABCOCK.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—W. D. R. writes: I have heard quite a discussion on dry plates, some claiming they are best when fresh and others claiming they ripen with age, getting quicker and better. Would you or some of your writers through the BULLETIN give me your opinion of this matter in regard to photographic dry plates?

A.—Our own experience with dry plates is that for many months, perhaps a year, there is no perceptible change; but after that time they appear to become slower in their action and work with more density. This is true of several brands of plates that we have used from time to time.

Q.—T. L. B. writes: Will you please answer the following through the BULLETIN? Is Omega paper toned in one bath as permanent as albumen paper, and can you give me a formula for toning and fixing this paper?

A.—If you are using Omega paper, you must follow the directions that are given with the paper in the package in which it comes in the market. It is a great mistake to try any other formula than that given by the

makers. As to its keeping qualities, time alone will tell ; it is of too recent introduction to compare it with albumen paper.

Q.—E. J. S. writes : In the July 26th number of the BULLETIN of 1890, page 429, there are directions for making blue prints and changing them to black and green tones, but the proportions of the solutions to be used are not given. Can you enlighten me on these points?

A.—The answer to this question was given in the last number of the BULLETIN, page 671, in the reply to Mrs. K. L.

Q.—P. W. writes: Can you avoid the marginal distortion of a single-view lens by using only the center of the plate, or does the distortion extend to the center only in a modified form?

A.—The distortion will be found on the center of the plates. This can readily be shown if a negative is made of a net-work of lines forming squares. These will be either of the form of a pincushion or else barrel-shaped, according to the position of the diaphragm behind or in front of the lens.

Q.—D. F. P. writes: Can you inform me where I can get full information regarding "Blue Printing"?

A.—For making small prints the directions given with packages of blue print paper are generally sufficient. If you desire to work on a large scale you will find an excellent article on "Blue Printing" on page 231 of "The International Annual" of Anthony's Photographic BULLETIN for the year 1889. It is very complete, and was written by Mr. C. B. Talbot, the architect of the N. P. R. R.

Views Caught with the Drop Shutter.

MR. CAMERON SWAN, son of the celebrated English dry plate maker, gave us a call recently. He is visiting New York in the interest of Annan & Swan, who have extensive photogravure works at Lambeth, London.

MESSRS. J. V. ESCOTT & SONS, of Louisville, Ky., write us: On the afternoon of October 26th, a boiler in the electric light plant in the rear of our premises exploded, setting fire to the building adjoining ours, and damaging part of our goods and building to such an extent that we have had to remove to other quarters. We are now located in the commodious four-story building No. 321 West Market street, near Fourth avenue.

W. H. BARTHOLOMEW, the successor to Bartholomew & Peckham, sends us a handsome portfolio of half-tone prints made by his processes, which are gems of photo-mechanical printing. The marvelous effects obtainable by this process must be seen to be appreciated. We tender our thanks for the kind remembrance.

B. N. NOYCE, of Tuscola, Ill., has just completed a new studio at a cost of $4,500. We wish him every success in his enterprise.

J. L. RIES, of Zanesville, O., was burned out on October 27th last. The loss was $2,000, and was fully covered by insurance.

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PRINTED ON N. P. A. EXTRA BRILLIANT ALBUMEN PAPER.

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Dana NEW YORK.

NEGATIVE ON CRAMER PLATE.

ANTHONY'S

Photographic Bulletin.

EDITORS :

PROF. CHARLES F. CHANDLER, PH.D., LL.D.

PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. DECEMBER 12, 1891. No. 23.

THE BULLETIN—ITS WORK IN 1891—ITS PLANS FOR 1892.

DURING the past year we have aimed to make the BULLETIN an accurate record of the photographic progress of the world. As may be seen by an examination of its well filled pages, every event of importance has received attention, often the first published in America. It is perhaps difficult to see how we could have done more; yet we have determined that the journal shall continue to deserve its well earned reputation as "the leading photographic magazine of America." To this end we have made arrangements for the coming year which will give our readers still more interest in the journal and commend it to a yet larger circle of subscribers.

In future the editors will, in addition to their present resources, have a further number of regular contributors on the paid staff of the BULLETIN. Among these we intend to include the following well known writers on photographic subjects, whose articles, written exclusively for this journal, will be eagerly looked for by all professional and amateur photographers :

Mr. H. P. Robinson, of Tunbridge Wells, England ;

Dr. F. Stolze, of Berlin, Germany ;

Professor C. H. Bothamley, of England ;

Dr. J. Gaedicke, of Berlin ;

Professor Alexander Lainer, of the Imperial Institute, Vienna ;

The Rev. F. C. Lambert, of England ;

Captain Eugene Himly, of Berlin ;

Professor R. Meldola, of the Finsbury Technical Institute, England ;

Mr. G. H. Croughton, of Rochester, N. Y. ;

Dr. Ellerslie Wallace, Jr., of Philadelphia ;

Mr. H. Harrison Suplee, of Philadelphia.

It will be seen from the above list of names that we shall endeavor to keep our many readers well posted upon all the various phases of photographic work, and that we are sparing no expense that will conduce to this end. The contributions from the above writers will embrace practical topics from the best known

practical workers ; art topics from artists ; scientific discussions, and articles that will interest the amateur as well as the professional photographer.

In addition to the above we have yet another surprise for our readers. For some time past we have had regular correspondents both in Germany and England who have supplied us with special letters upon current topics in those countries. We have now succeeded in arranging for a similar special "Letter from France," giving the latest news in both France and Belgium, and take great pleasure in announcing that M. LEON VIDAL, editor of the *Moniteur de la Photographie* of Paris will be our special correspondent.

When we look over the work of the BULLETIN for the past year, and note the contributions of Dr. H. W. Vogel, "Talbot Archer," Dr. J. J. Acworth, Professor W. K. Burton and many others, together with the articles from the editors and their staff, the reports of societies, the answers to correspondents, and when we further contemplate the prospectus for the coming year, which will include all these and much more as above stated, we are inclined to ask : What else can we do to make the BULLETIN useful to its many readers ?

If you believe in the BULLETIN and its work, tell of it to your neighbor and friend, and get him to send his name for our subscription list before the new year begins, that he may not miss any of the good things it is sure to contain in every number.

THE PUBLISHERS.

EDITORIAL NOTES.

SOLUTION of celluloid may readily be prepared that will prove useful for coating trays or other dishes, and that will resist the action of acids and alkalies, by taking spoiled celluloid films, and after removing the emulsion by soaking in a soda solution, dissolving them in fifty times their bulk of amyl-acetate. The resulting celluloid solution serves admirably as a varnish for negatives, or may be used to flow glass plates, and when dry, stripped therefrom to serve as a support for prints, or many other purposes. The solution, after the lapse of a few days, becomes extremely hard and closely resembles ivory.

EXPERIMENTS recently made in England with magnesium wire ignited in a globe charged with oxygen, tend to demonstrate the advantage of this method of working. Excellent results have been obtained in platinotype with an exposure of less than a minute.

THE Hiawatha Camera Club has been organized in Minneapolis to take in as active members residents of either of the sister cities. Meetings will be held monthly.

AN alkaline alum solution, recommended by B. Kröhnke, is obtained by dissolving two parts of alum in ten parts hot water, and gradually pouring it into a solution of caustic soda one part, hot water ten parts. After cooling and filtering, if added to the ordinary hyposulphite of soda fixing bath, it will harden the film and assist in the clearing of same, serving much the same purpose that the acid sulphite now does. We do not see why it is necessary to go to all this trouble, however, while the latter is so easily obtainable and performs its work so faithfully.

WE are in receipt of a series of five prints of babyhood from W. J. Hick-

mott, of Hartford, which depict the phases of child life with a remarkably strong and sympathetic touch. The artist writes that the original is the "boss boy" this side of the Mississippi River, and from the way in which he sustains a pose we are inclined to think him justified in his claim.

A NEW departure in lantern work consists in a condenser constructed with two 5-inch lenses, and a third lens, much smaller, which serves as a collector of the rays and concentrates them in the focusing lens. In order to obviate the necessity of re-focusing for each variety of slide and to render the illumination of the screen uniform, the condenser is fixed to a solid base to which the lime-light is also attached and the base made to travel on metal grooves over a bed plate to which is rigidly attached the front plate of the lantern, carrying the focusing lens and slide. The tray, carrying the condensing lenses and the light, is made to work forward or backward by a rack and pinion movement, and is so arranged as to be elevated or depressed and turned to the right or left independently of the base carrying the front.

THE College Camera Club of Akron, Ohio, opened their winter's series of entertainments on the 23d of last month with a very interesting paper on retouching negatives and a lantern slide entertainment. Several evenings are arranged for with interesting and instructive programmes.

IT is reported that the metric system of weights and measures will shortly be compulsory in Finland, which has already for some time past used the decimal coinage. It is in the air that the metric system is soon to be adopted in Russia also.

A RATHER unique exhibition of photographs was made last month at a local fair in Hartford of a large collection of portrait work made in the fair without the aid of background or accessories. The idea was to obtain thoroughly characteristic poses and expressions, and the work is spoken of by those who should know as being extremely artistic and entirely successful. Mr. Bundy officiated at the camera, and was assisted in the posing by Mr. C. N. Flagg, a well known artist of that city.

THE courts in Berlin have lately been called on to decide a case in which a clerk was accused of having put in circulation a bill of exchange without first attaching the required stamp. He claimed that he had done so, and suggested that it might have been removed. Dr. Bein, the judicial chemist, however, clearly demonstrated by comparing enlargements of the bill in question with others that had been duly stamped and the stamp removed immediately, that no adhesive material had been applied to the bill under dispute.

THE organization of the Colorado Camera Club was effected early in November and the club starts out with a membership of seventy-five. Mr. H. S. Bellsmith, of Denver, is actively interested in the club, and believes that the various organizations of amateurs throughout the world serve to promote the best interests of both the amateur and professional photographer and to create a better feeling between them. We wish the club all possible success.

The amateur photographers of Nashua, N. H., have organized under the following officers: President, Fred. H. Morrill; Vice-President, George Smith; clubrooms are to be obtained at once and the club proposes to commence an active existence.

It is said that a positive picture may be made with ordinary writing ink by sensitizing albumenized paper on a 6 per cent. bath of bichromate of potassium and when dry printing in the ordinary way; after the print is made, it is washed and then quickly brushed over with common writing ink, which after being washed and dried turns from a violet black to warmer tones by exposure to light.

We have to express our regrets at our enforced absence from the private exhibition of prints by the Newark Camera Club on the 23d of last month. The exhibition, which lasted until the 5th of December, was a most interesting one, and indicates a marked advance for the club, over 200 frames of pictures being shown. Much of the work was extremely creditable, noticeable among which were collections by Mr. Charles Leroy, President of the Club, William Archibald and Dr. T. Y. Sutphen.

Several experiments recently made by Professor Eder and E. Valenta, of Vienna, with the different compounds of magnesium powder, show that mixtures of magnesium containing explosives are much quicker in their action than those where only magnesium is employed, the nature of the oxygen substance in the combination governing the intensity of the flash and the ratio of combustion. They find that three parts of permanganate of potash and one part of magnesium explode violently and that the magnesium is not wholly consumed, while if a much smaller quantity of permanganate, say from three-quarters to one part, is employed, the explosion is not so violent and the intensity of the light greater. Ammonium and potassium bichromates burn with a noise like escaping steam, and produce a light of somewhat less intensity. Saltpetre and magnesium in equal parts produce a light of good intensity without violence.

It is pleasant to feel that our amateur societies are not wholly selfish in their efforts, and we note that the California Camera Club provided a very entertaining and instructive exhibition of 200 lantern slide pictures, given in aid of the San Francisco Nursery for Homeless Children on the 27th of last month, on which occasion some sixty little tots were benefited by the handsome sum received for admission. The institution is in a financially crippled condition and dependent on the labors of its friends and the public for support, and the action of the club can doubtless be emulated by many others throughout the country in similar directions.

The fourth general meeting of the American Chemical Society is announced to take place in New York City on the 29th and 30th inst., and all interested in the progress of chemistry are cordially invited to attend. The Secretary can be addressed at University Building, Washington Square, New York.

Our regrets are due and hereby tendered that we were unable to attend the opening reception given on the 21st November by the artists of the Manhattan

Building. We understand that the affair was most enjoyable, as we knew it would be, but pressure from other sources rendered our absence unavoidable.

THE use of pyrocatechin developer is highly recommended by many who know whereof they speak, for the production of lantern slides on gelatine bromide plates, as it is said to produce those beautiful brown-gray tones so much sought for. The formula recommended is, to dissolve A, 1 part carbonate of potash in 10 parts distilled water, and B, 1 part pyrocatechin in 50 parts distilled water. If an extremely soft transparency is desired, it should be used as follows:

Solution A	20 c.c.
Solution B	3 "
Water	60 "

The exposure should be full timed and the development slow, and after rinsing, the plates should be fixed in ordinary hypo without acid sulphite. In case of a more vigorous and positive slide being sought, the exposure should be only about one-half as long, and the proportions as follows:

Solution A	20 c.c.
Solution B	10 "
Water	60 "

If desired, a few drops of potassium bromide solution, 1 to 10, may be added as a restrainer, in which case the development will be much slower, and this second formula, when old, will be found to increase the brilliancy of a transparency considerably. Either formula may be used to develop several plates if used quickly.

THE fourth annual print exhibition of the Springfield Camera Club, which was held from the 16th to the 21st of November, was most successful in every way, and showed the rapid strides made by the club, and the variety of subjects exhibited speaks well for the artistic discernment of the exhibitors. A large number of prints were shown by members of the Home Club, and a very pleasing feature of the exhibition was the collections sent by neighboring societies, among which were represented the Hartford, the Providence, and the Lowell Camera Clubs, the Worcester Polytechnic Institute, the Photographic Society of Waterbury, the Camera Club of Portland, Me., and the Mystic Camera Club of Medford, Mass.

FROM Mr. A. L. Blanks, of Vicksburg, Miss., and Birmingham, Ala., we have received a number of prints made on the new "Aristo" paper. These pictures are uncommonly well done, and reflect great credit both upon the paper and also on Mr. Blanks, from the fact that he has produced them without any previous experience with it, and has never seen a demonstration of its use. They are full of delicate gradations and the tones are admirable.

All communications for the columns of the BULLETIN *should reach us on Monday preceding the day of issue, to insure their publication at that time.*

[*From our Special Correspondent.*]

ENGLISH NOTES.

As a member and whilom office-bearer of the British Association for the Advancement of Science, I am greatly pleased to see that this important body is recognizing the aid which photography can render to science. The report of the Geological Photographic Committee, which came to hand this morning from its secretary (and my esteemed friend) Mr. O. W. Jeffs, of 12 Queen's Road, Rock Ferry, Cheshire, shows that during the past two years the committee has obtained 588 photographs illustrating various points of interest to geologists, such as "characteristic rock exposures, especially those of a typical character or temporary nature; important boulders, localities affected by denudation, or where marked physiographical changes are in operation, raised beaches, old sea cliffs and other conspicuous instances of marine erosion, characteristic river valleys or escarpments, and the like; glacial phenomena, such as *roches montonnées*, moraines, drums and karnes, or any natural views of geological interest. Photographs of microscopical sections and of typical hand specimens of rocks are also admissible." The size recommended is whole plate (8½ x 6½ inches), but this is optional. A printed list of the photographs already obtained accompanies the committee's report. It is pleasant to know that this good work has been taken up in the States; the Geological Society of America has appointed a similar committee, and nearly three hundred examples of the kind of pictures desired were exhibited at a meeting of this society held in Washington last December. The American geologists also intend preparing lists of their photographs for international exchange.

Every photographer ought to be a scientist—at least to the extent of belonging to the scientific societies of his district. I often feel surprised that professional photographers seem to stand aloof from all such organizations. "Photography is the handmaid of science," but it is a fact that the great majority of scientists do not as yet know how to photograph. Here is where the skill of the professional would come in. Even from a mere business point of view I feel sure that it would "pay" the professional to interest himself more in scientific work than he does at present.

It is with intense delight that I am enabled to announce the fact that a testimonial which, if it is to be worthy of its object, will be a noble one indeed, is to be presented to the father of the gelatino-bromide dry plate process, Dr. R. L. Maddox. His discovery was first published in the *British Journal of Photography* for 8th September, 1871, so that 1892 will witness its "coming of age," and it has been felt that the occasion will be a most suitable one for recognizing and honoring the services of its originator. Dr. Maddox is now old, feeble (in body), and ill. All his life he has suffered from a painful internal disease. All his work has been given freely to the world of science, for he has never patented any of his discoveries. The Maddox Testimonial has been started by a donation of one hundred guineas from the Ilford Dry Plate Company, and we venture to think that this will not be the worst investment which they ever made. A powerful committee is being formed in London, and it is intended to appeal to the photographers of all countries (for all the world has profited by Dr. Maddox's work) to aid in the pleasant task of cheering and sustaining his declining years. I feel certain that America will take a noble part in this good work.

I have lately done a good deal of printing in platinum, sensitizing my own

paper, and with good results. The process is easy, and once tried will be persevered in, for the results are as charming as they are permanent. Buy a few sheets of the very best white drawing paper which can be obtained. This must be sized by soaking it for a few minutes in the following liquid :

I.—SIZING SOLUTION.

Gelatine	80	grains.
Alum	25	"
Methylated spirits	3½	ounces.
Water	14	"

Soak the gelatine in the water for twenty minutes ; then dissolve by gentle heat, and add the other ingredients. Filter the whole through two or three thicknesses of fine muslin.

I cut the paper into pieces, each 6½ x 8½ inches, before sizing it. After soaking for five or ten minutes, the sheets of paper are drawn out over the edge of the vessel, and pinned to a string stretched across a warm room to dry.

II.—STOCK SOLUTION OF POTASSIUM.

Chloro-platinite of potassium	80	grains.
Distilled water	1	ounce.

III.—STOCK SOLUTION OF FERRIC OXALATE.

Ferric oxalate	90	grains.
Distilled water	1	ounce.

Of course everything depends on getting the *right* chemicals, and as these are not in common use, they must be obtained from first-class houses only.

IV.—SENSITIZING SOLUTION.

Of stock solution No. II	¼	ounce.
Of stock solution No. III	¼	"

This mixture will not keep for more than twenty minutes.

The paper must be coated by yellow light (candle-light will do). To spread the solution use a piece of perfectly clean sponge ; or a ball made by tying a little cotton wool in a piece of flannel.

For a piece of paper 6½ x 8½ inches (whole plate size), about forty minims of the sensitizing solution are required. Pour this on the center of the paper, and spread it all over by using the sponge. The paper will then be of a pale yellow tint. Let the paper lie face upward for five or six minutes, or until surface dry ; then dry it thoroughly by holding the back of the paper near a clear fire. The yellow hue deepens to orange as the paper dries. The paper is then ready for use. It must be kept very *dry* (best in a calcium tin).

To use the paper it is exposed in contact with a negative to sunlight for about half the time required for a silver print. When a faint brown image is seen the printing is finished. It is then developed by floating it, coated side down, upon a hot (140 degrees Fahr.) saturated solution of neutral potash oxalate. Finally the iron is removed by soaking for ten minutes in a quart of water to which three-quarters of an ounce of strong hydrochloric acid has been added. After this it is only necessary to wash for twenty minutes in running water to remove the acid, and the print is ready for mounting.

In this brief description I have tried to reduce the platinotype process to its simplest form.

Captain Abney has lately published some interesting facts with reference to light. Comparing sunlight with candle-light he gets the following figures:

Luminosity.	Candles.	Photographic Value.	Candles.
Overhead	5,600	Overhead	120,000
30° above horizon	4,700	30° above horizon	72,000
20° " "	3,300	20° " "	42,000
10° " "	2,000	10° " "	9,000
At 8° 30′ above horizon	1,400	At 8° 30′ above horizon	5,600
Just before sunset	140	At sunset	2

The figures are for "a cloudless day in June."

This shows that sunlight falls off far more rapidly in photographic than in optical value as the sun nears the horizon; a circumstance which explains the long exposures always necessary at sunset, notwithstanding that the landscape may still seem "full of light." Captain Abney further finds that with sunlight at its best an exposure of from fifty to sixty seconds is sufficient for a platinum print. With the electric arc light it is quite possible to obtain prints in ten minutes, or even enlargements in from twenty to thirty minutes, by the platinotype process. Finally, Captain Abney finds that the photographic value of the light of the most brilliant full moon is about 400,000 times less than sunlight at mid-day in summer. Hence by this brilliant moonlight it would require only 277 days, 18 hours and 4 minutes to obtain a platinum print equal to that produced by sunshine in one minute. "Printing by moonlight" must be a very picturesque process, and opens out some fine possibilities of enlisting feminine aid; but it is slightly too slow for TALBOT ARCHER.

PHOTOGRAPHY APPLIED TO SURVEYING.

[Read by G. W. Pearsons, C. E., before the Photographic Society of Kansas City.]

AT the last meeting of the Photographic Society of Kansas City (being a Special Meeting), held on November 18th, the following very interesting paper was read by Mr. G. W. Pearsons, one of the leading Civil Engineers of Kansas City, as well as an amateur photographer of considerable experience.

"The subject of 'Photography Applied to Surveying' is one not as yet taught in our technical schools, and there are probably few who can write or speak on it as teachers; of these few I am not one.

"Having had occasion to do some topographical work and having dabbled a little in photography as an amateur, I was interested in bringing them together by a work on the subject by Lieutenant Reed, U. S. A. To the engineer accustomed to the definite line given by his transit, the first idea of having the whole landscape on his table is likely to be received with mistrust; but when we recollect that some of the most important studies in astronomy have been forwarded very materially by photography, we may consider that in the much more accessible field of our work it may be equally useful.

"It may be assuming too much to consider any one here wholly unacquainted with the subject, but it can hardly be treated except by going over the ground in a rudimentary manner.

"The focal length of cameras best adapted to this work being from 12 to 15

inches, may be imagined to represent an eye of that diameter and should therefore show its objects somewhat more fully than the unassisted eyesight. The ordinary camera, however, has no means of determining exact locations, except relatively, and cannot be considered as in any manner dispensing with the transit.

"The image formed on the sensitive plate represents a series of right lines passing through the center of the lens from the landscape to it. If, therefore, the plate is in correct position it will give a mathematically correct copy, capable of direct measurement, and to a much greater degree of accuracy than would be at first imagined. The sensitive plate can retain an exceedingly accurate image of anything it gets a wink at, but it is indifferent to the circumstance of position, and it makes no difference to it whether it rests on a granite obelisk or the quarter deck of a mule.

"To become useful for purposes of precision, proper regard must be paid to the position of the plate and camera. The plate must be truly vertical and its edges truly horizontal. The first is of greatest importance; the last is important for the proper definition of the horizon and the connection of the plate with others.

"The angle covered by the plate must be known, and it is of very material assistance to the work to be able to so direct the instrument that each plate will give the same lap on each edge. For this purpose the interval between the centers of any two pictures should be from two to three degrees less than the whole measure of the plate, not only because faults are likely to occur on the edges of the plates, but to afford means of accurately joining them by inspection of the similar objects shown on the edges of adjacent plates.

"Engineers sought for more effective means of work than given by the plane table before photography existed, and even in its earlier stages made many efforts to utilize it. Now that the camera is so common an adjunct to the engineer's outfit and so little trouble and uncertainty is found with its use, even by amateurs, it offers a help worth utilizing.

"Supposing that the camera is found to show 38 degrees on the plate by allowing 1 degree on each edge for lap, we have for each plate 36 degrees, or five for 180 degrees, which is as much as is generally needed for one station.

"This is about as given on the plates shown here, but I believe I should decidedly prefer 5 x 8-inch plates with a useful angle of 30 degrees, which would require one more plate for each 180 degrees; but as these plates cost but one-half as much as the 8 x 10 and are almost always deep enough vertically, their lesser cost, lightness of transportation and less liability to distortion on the edges of the plate on account of the lesser angle will, I think, overbalance the added number of plates required.

"These plates require that the center be correctly located, both vertically and horizontally, as they must be measured by a scale of tangents from the vertical center and horizon. In ordinary use the camera is focused separately for each picture, but as differences of focus for landscape distances are very slight, the camera for this use is focused on a distant object and marked, so that all pictures are taken with the same focal distance and can therefore be measured by the same scale of tangents.

"In Lieutenant Reed's instructions, as I understand them, he provides for marking the plates by inserting needle points in the plate holder so that the points will make a mark in the film on the top, bottom and sides of the plates.

"I do not see how this is practicable with an ordinary camera, though it may be with one if made as an instrument of precision.

"In the first place, each plate holder would require to be provided with points, making a very serious job to fix, say, a dozen double plate holders so that they would correspond. Again, these holders hook onto the back of the camera and necessarily have some play, making, it seems to me, both a difficult and uncertain means of uniform register, to say nothing of the liability that some of the points may fail to make their mark.

"I have substituted the following arrangement. The camera itself gives means of reaching within about one-eighth of an inch of the sensitive plate. By placing needle points at the top, bottom and sides so as to mark the vertical and horizontal centers, their shadows are thrown on the plates, and are sure to be alike on all the plates as regards the position of the camera itself, no matter how the plate may stand in the holder or the holder on the camera.

"The image of the needle is somewhat enlarged, but as the distance from the needle to the lens is perhaps 100 times that to the plate, the enlargement is not much, and being uniform is not troublesome.

"It remains to place the camera correctly. All my attempts to use the usual tripod have been failures—it is too light, and the means of making uniform angles between the pictures and of insuring the leveling of the camera are too uncertain. I therefore made a table attached to the guard cap of the transit tripod, furnished with leveling screws, two levels and the edge marked into degrees, for convenience of making the pictures cover approximately equal angles. This being carefully leveled and having the stability of the transit tripod, enables a series of exposures to be made with a fair degree of uniformity, which is almost a necessity where it is required to join several pictures. By this means a long tangent scale can be used to cover any number of plates, care being taken to see that the centers of the plates correspond approximately to the centers of the corresponding tangent scales, and the whole read consecutively, which is much more convenient than a separate study of each plate.

"It will be understood, of course, that to use such a scale the exposures must cover approximately the same angle, otherwise the centers of the plates would not correspond with the centers on the scale. Exact correspondence is not necessary, because the size of each degree varies so little from the next that a slight displacement would not make any perceptible difference, as it is only the difference in their sizes that is to be considered, and not the angular location otherwise.

"Now, having our camera in order and as many plates as we want for the trip, we load up our camera and transit and with notebook and a few cigars are ready for the field.

"Proceeding to our starting point, we place our heel carefully, turning upon it and looking wise in several directions to assure our assistants that we know exactly where we are starting from, drive a peg, put a tack in it with like scrupulous care and set up our transit; with this we take such notes and observations as will determine salient points in the photographs, by which they can be adjusted and placed, and in this, as in preliminary railroad work, it will be convenient to read directions from 0 to 360.

"We now take the transit off the tripod and put the camera in its place, commencing at the left of the field. Having set it as we desire for the first plate, we note

the degree covered by the center mark on the bottom of the camera. Suppose it to be 19 degrees and our camera to cover 35 degrees, our successive settings will be 54, 89, 124, 159, 194 and so on, and though any one of them may be slightly misplaced, for a rough setting like this is not a transit direction, the error is not cumulative, and the notebook, by giving the direction of salient points in the different plates, enables the tangent scale to be applied to the whole correctly.

"Here it will be proper to remark that the person taking these plates does not want anybody to help him or talk to him while he is doing it.

"It is a very simple thing to take holder No. 1, fasten it to the camera with plate No. 1 toward the lens, draw the slide, make the exposure, replace the slide and change sides with the holder for the next view; it doesn't take more than a minute or so, and but a few minutes to take a whole set in regular sequence and all O. K. But let some interested or interesting party assist, and may be you will forget to turn the holder for the second view—and take two on the same plate, or you may make an exposure without drawing the slide, or become so interested as to take the holder off the camera without putting the slide back. Or when you come to make an exposure find the cap is not on and the camera has been looking out all the time you were making the plate ready, and another one is spoiled; and in general you won't know till you develop your plates whether you have got a full set or not. The old notice of no conversation with the man at the wheel applies just as well to the man at the camera.

"Proceeding to the next point, a set of views is taken in the same manner, intersecting the first; the points of observation being known, these intersections determine any desired point in the field of view; the third station bears on the first two, the fourth on the second and third, and so constitutes a continuous triangulation, on which most points may be defined by three intersections. Any point determined by these intersections is also defined as to height by the tangent of its distance from the point of observation. The plates, therefore, give vertical as well as horizontal definition of the field, and with a degree of accuracy which will surprise the beginner.

"In making these plates due care must be taken to so mark them that they will not get mixed. I have found that a steel point with which I could mark the number of the plate on the film before placing it in the bath is a means of making a mark which won't rub out and makes it easy to keep them in order.

"Our plates being developed, the next thing is how to use them. For convenience we want positives, put together so as to form a continuous landscape; this is not strictly necessary, but is far the most convenient.

"I have tried silver prints, bromides, etc., but find common blue prints better than anything else I have found yet. The silver prints give finer definition, but can only be kept in place by mounting, with its inconvenience and added liability to distortion. Tne bromides are very expensive and give no better definition than the blue prints. The blue prints are very cheap, and with the negatives at hand for reference, if needed, answer a very good purpose.

"In making transit surveys with a view to assistance from photography, such salient points must be located as will give the most comprehensive views. The engineer then takes to his drawing table not the isolated notes of his field book, but a comprehensive view of the whole area of his work, which can hardly fail to be both of interest and use.

"The blue print map of the bend in the Missouri was made from the accom-

panying blue prints from negatives taken from Fifth and Bluff streets in this city, the foot of Minnesota avenue in Kansas City, Kansas, and some other points not represented.

"Some of the plates are faulty from the camera leaking light, which was not discovered till too late; as they answered the purpose, however, and I had not time to repeat them, the smoky condition of the atmosphere making it difficult to get good views, I used them as they were.

"In making views in the vicinity of the city, good definition of distance can hardly be obtained in the fall of the year. This will, however, seldom interfere with such distances as will be needed in usual work. In the spring the air is clearer and better definition of distance can be made.

"For reconnoissance the camera offers some pleasant features. The public are always anxious to know what an engineer is doing with a transit, but if he has a map of the county and an aneroid in his pocket, so that by fences or otherwise he can tell pretty near where he is, he is only an amateur artist making views of scenery, and the farmer is not suspicious that he wants to run a railroad through his corn crib; such pictures understandingly used may help to decide where a line will probably be best, so far as general features of the country are concerned, and many interesting and amusing incidents and situations will place themselves on the plate (with a little help) and make the work less prosaic.

"Progress is the order of the day. It is not long since the engineer who used a camera to take occasional or semi-occasional records of the progress of his work was rather putting on airs; the blue print and camera have come in very handily—so handily that it is not the engineer who uses them, but rather the one who does not, who is the exception.

"If some chap tired of climbing the hills in San Francisco had not got up a cable road, we might be hanging onto bobtail cars here; if some other chap hadn't got tired of climbing stairs and got up an elevator, we should need more ground for our cities and should have conflicts of jurisdiction between this town and St. Louis—or some similar trouble; as it is, the farmers still have some room left. All that helps to expedite our work is useful and this is one of the items. It will not, however, be likely to dispossess us of our transits very soon, though the engineer who becomes familiar with it, especially in such work as making close topographical surveys, will have a very great advantage of him who does not."

PREPARING STRONG FERROUS OXALATE.

[Read before the Photographic Society of Philadelphia.]

BY C. W. MILLER.

The strongest form of oxalate developer, made by dissolving ferrous oxalate in potassium oxalate, is not as much used as it deserves to be, the explanation of which, no doubt, is to be found in the very considerable amount of trouble entailed in the ordinary manner of preparing it. Thus, two distinct procedures are required; first, the precipitation of the ferrous oxalate; then the solution of it in the alkaline oxalate, which operation is not very satisfactory on account of the tendency to precipitation if heat be applied for any length of time. In trying to find a more convenient plan of getting a saturated developer I hit upon the following, which I find answers every purpose.

By estimating the quantity of iron actually in solution in different developers, and, further, of the point (volumetrically) when precipitation takes place, I found that I could not in any way make a developer which should permanently contain over about 0.65 grams of ferrous oxalate per 10.0 c.c. Acting on this datum, I took a saturated solution of potassium oxalate, and to it added an excess of the oxalate which would be sufficient to convert enough ferrous sulphate to make the 0.65 gram of ferrous oxalate. The excess of the alkaline oxalate so added was gotten into solution by heat, when the iron was added.

In this manner a developer was produced without excess of anything except the inert potassium sulphate formed in the reaction.

In comparing a developer so obtained with the strongest form of the ordinary one (say that issued by the Eastman Company for their bromides), we find that the latter contains for every 10.0 c.c. 0.59 gram ferrous sulphate, which quantity can only give 0.3 gram of ferrous oxalate, as against at least twice that in a saturated developer.

In practice the most convenient way to make up is to dissolve the full quantity of alkaline oxalate at once in water, so that the formula reads :

Potassium oxalate	330.0 grams.
Ferrous sulphate	135.0 "
Water	690.0 c.c.

Dissolve the oxalate by the aid of heat ; then cool until it just begins to be precipitated ; than add the crystals of iron at once. After solution has taken place, cool completely as rapidly as possible (I place the containing vessel in cold water) and filter off into closed bottles.

In the above we have 250.0 grams of potassium oxalate which remain in solution, while the other 80.0 grams are lost in forming the oxalate.

The quantity of water necessary to hold 250.0 grams of potassium oxalate in solution is 760.0 c.c., but we need only take 690.0 c.c., since the 135.0 grams of ferrous sulphate will furnish 60.0 c.c., the sulphate crystallizing with seven molecules of water.

The oxalate of iron is slowly precipitated after the bottles have stood some time, therefore it is better not to make up a large stock at a time. The formula is calculated to give an excess of ferrous oxalate of 0.15 grams in each 10.0 c.c., most of which will remain for a short time in solution. The iron and potassium oxalate are balanced.

REVERSED NEGATIVES.

BY A. H. CALDERWOOD.

Of the many processes for getting reversed negatives for use in zincography, none are more universally used than the stripping of the film from the plate on which the photograph was taken, and placing it (reversed of course) on another which is prepared for it.

Negatives made in this way are better, and the time lost in stripping is fully made up in shortness of exposure as against the use of a prism or reversing mirror

Furthermore, several different negatives may be placed on one plate, and the printing on the zinc plate and etching all done in one operation. To successfully reverse a negative proceed as follows:

The negative which has been exposed, developed and intensified, and is perfect in every respect, is allowed to dry (heat may be used), and is coated with the rubber turning solution. This can be bought prepared or may be made by dissolving Para gum in benzole to the thickness of collodion.

The plate is coated the same as in collodionizing, the surplus allowed to drain in the bottle. It is then allowed to set, which is shown by its losing its glossy appearance.

Now coat with a thin plain collodion. This will set immediately. Now run a sharp pointed instrument around the film to be stripped, leaving an inch margin. The plate is now placed in a tray containing acetic acid and water 1 to 5. It is allowed to remain here a few minutes, when it is removed, well washed under the faucet, and the outside experimented with to see if the film will strip easily. If not it should be returned to the tray again. When ready the film outside that to be stripped is removed, and starting at one corner the film is gradually lifted until the other corner can be grasped, when the whole film can be easily lifted up and placed (flopping over) in a tray of water in which the plate to receive it has been previously placed.

Now, by lifting this plate from the water and guiding the film it will cling tenaciously to its new support. Any air bells may now be removed with a piece of soft cotton or squeegee, when it is set aside to dry.

[*From the British Journal of Photography.*]

AN ELECTRO-PHOTOTYPIC PROCESS.

THE demonstration given by Mr. Henry Sutton of his process of engraving, during the present week, to a large number of experts in electrotyping, block-makers, illustrated newspaper men and others, calls for a few words, not of criticism—for we may as well say here that the demonstration was successful throughout—but of cognate explanation. First of all, we may state what Mr. Sutton's process is, and how it is worked now that he has had time to get it more consolidated than was naturally to be expected when he first brought it out at the Camera Club Conference in April last.

What we witnessed on Monday was the following: An ordinary gelatine dry plate was placed in a dark slide, a screen of finely ruled lines being in front of the sensitive surface although not in contact with it. This was then placed in a camera and an exposure made, the print to be reproduced being lighted by strips of burning magnesium—for the day and place were too dark to permit of daylight being utilized. The negative was then developed by pyrogallic acid rendered alkaline by sodium carbonate, the restrainer being ammonium bromide. After having been developed, fixed and washed, the surface water was removed by pads of paper. These operations were necessarily conducted in a darkened room adjoining, in presence of a selected committee. On being brought out to daylight, the plate was submitted for examination, and it was seen to be a negative of the usual sort; close inspection showed the grating by which the printing grain was to be subsequently imparted.

Mr. Sutton then lighted a gas stove, on the top of which he placed a porcelain lined dish, on which the negative was laid face up. As it became warmed, the previously flat surface of the negative was seen to rise in ridges corresponding to the amount of silver forming the image, and in three minutes this part of the operation was completed. All that remained now was to render the surface a conducting one by plumbago, or the other and well known means capable of being employed for this purpose, and place it in a solution of copper sulphate to obtain an electrotype, which, when mounted upon a block of wood, was then ready for being printed from along

with ordinary type. This, in all but the making of the electrotype, which requires several hours, was the process witnessed by us, and, as stated, the demonstration was successful throughout.

While writing this, we are not yet aware of the precise claim made by Mr. Sutton in his patent. We imagine, however, that it will consist in the application of the ruled screen to a gelatine plate, the image on which is to be placed in relief according to the manner just indicated. About ten years ago, Mr. J. W. Swan observed that the surface of a gelatine negative could be brought into relief by a final drying by heat, and he, at that time, obtained a patent for its application to printing purposes through the agency of an electrotype mould obtained from it after the surface had been rendered conducting. But if we remember aright, there was no suggestion of the ruled screen to be used in connection with his invention. It may be said that this is only a small matter, but the success of many inventions depends largely upon small matters, and in the present instance it is the screen, by which a *cliché* is obtained, which eventually yields a block capable of being worked in the ordinary typographic printing press.

As regards rapidity of production, we are not aware of any system that can vie with that of Mr. Sutton. Every one knows with what rapidity it is now possible to take, and to develop and fix a negative; and, as we have shown, the succeeding operation, with the exception of the electrotyping, occupies only a few minutes. But if the inventor succeeds, as he expects to do, in obtaining a stereotype casting from the negative, then will it be possible to place the whole of the operations, from the receiving of the photograph to the handing over the block to the printer, within the compass of an hour.

There is, too, an advantage in producing the block direct from the negative—direct, that is, from the glass plate on which the negative is taken. So far as we recollect, M. Placet was the first to adopt this method. His engraving process, it may be remembered, consists in varnishing the negative with bichromatized gelatine, and when dry exposing the same to light through the negative, and then washing away the unaltered gelatine by tepid water. This yields a surface in a degree of relief corresponding to the penetration of the light through the gelatine coating, and from such uneven surface an electrotype is obtained. The great beauty of some of Placet's engravings leads us to wonder why the process is not more generally employed, for, as we proved experimentally when it was published, there is no difficulty whatever in working it. The ink holding tooth (we are now referring to his photogravures) was imparted by chemical means, and we gave the requisite conductivity to the surface by three different methods—viz., by graphite or plumbago, by rubbing it with fine bronze powder, and by brushing it over with nitrate of silver, which was then reduced to the metallic state by methods well known. With Placet's process for producing surface blocks, we are less acquainted; but it seems obvious that, without a grating screen, which was not applied to it, its uses would be restricted.

PHOTOGRAPHIC CHEMISTRY.

By R. Meldola, F.R.S., *Cantor Lectures at Society of Arts.*

The action of light on the salts of copper forms a convenient introduction to the photo-chemistry of the silver salts. Thus, cuprous chloride darkens, on exposure to light, with as great a rapidity as silver chloride. It may be pointed out that the nature of the decomposition in this case is not completely understood. Wöhler conjectured that the product might be an oxychloride, and this view receives support from the circumstance that cuprous chloride does not darken under hydrocarbon oils or other liquids which do not contain oxygen. A. Vogel assigns a formula—$CuCl_2$, 3 CuO; but the subject requires further investigation.*

* See Dingler's *Poly. Journ.*, vol. cxxxvi, p. 238; also Carlemann, in *Journ. für Prac. Chem.*, vol. lxiii, p. 475.

A general discussion of the subject of photo-chemical decomposition, as illustrated by the foregoing and other examples, will enable the student of photographic chemistry to grasp the broad idea that modern photographic processes represent only the special applications of wider principles, and that photography with silver compounds may be but a passing phase in the history of the art. In the present state of knowledge, no rigorous classification of the cases of photo-chemical decomposition is possible, and it is only necessary to point out, and to illustrate by an appeal to some of the many known instances, how difficult it is to draw a hard-and-fast line between photo-chemical decomposition and photo-chemical combination, or between decomposition and dissociation under the influence of light. Many of the supposed cases of dissociation may be dependent on the presence of another substance capable of combining with one or the other of the liberated products, and thus playing the part of a sensitizer in relation to the present subject. From such considerations as these, it will follow that in all modern photographic processes we have to deal with a mixture of chemical compounds capable of passing into a more stable system under the influence of light as a source of external energy. If the new products formed in this way are so acted upon by reagents subsequently applied that a visible and striking color difference is produced, or if the new product differs in color from the original substance or mixture of substances, we have all the essentials for a photographic method.

When discussing photo-chemical decomposition it should be pointed out that indirect results are often obtained by using a mixture of substances of which one of the constituents is not directly affected by light, but is altered by contact with the product resulting from the photo-chemical decomposition of the other constituent of the mixture. For example, paper, coated with ferric chloride and exposed to light, gives a surface of ferrous chloride by photo-chemical reduction, the size or cellulose of the paper acting as the sensitizer (chlorine absorbent); but, if the surface is coated with a mixture of ferric chloride and cupric chloride, the ferrous chloride which is formed reduces the cupric salt with which it is in contact:

$$2\ FeCl_2 + 2\ CuCl_2 = Cu_2Cl_2 + 2\ FeCl_3.$$

The picture is thus formed in cuprous chloride, instead of in ferrous chloride, and, by treatment with potassium thiocyanate, cuprous thiocyanate is formed, which, on subsequent treatment with potassium ferricyanide, leads to the development of a brown print. This method of utilizing a mixture of ferric and cupric salts is the basis of Obernetter's process.

There can be no doubt that this principle of indirect decomposition is destined to play a very important part in the photography of the future. It has already come into prominence in the well known platinotype process of Willis, in which a surface is coated with a mixture of ferric oxalate and potassium chloroplatinite. On exposure to light, ferrous oxalate is formed, while the chloroplatinite is not directly reduced. On treatment with a hot solution of potassium oxalate the ferrous oxalate is dissolved out, and, at the moment of solution, reduces the chloroplatinite to finely divided platinum *in situ*. In the direct-printing platinotype process we have a surface of potassium chloroplatinite, sodium oxalate and sodio-ferric oxalate. In this case the reduction of the ferric salt by light is accompanied by the indirect reduction of the chloroplatinite by means of the ferrous salt thus formed. In the cold platinotype of Willis the operations are separated, the ferric surface being first exposed in the usual way, and then development being effected by immersion in a cold solution of potassium chloroplatinite containing potassium oxalate and phosphate.

The discussion and illustration of indirect methods of decomposition, as illustrated by the platinotype processes, may advantageously occupy the student's attention at this stage of his work. The chemistry is comparatively simple, and many experimental illustrations will obviously suggest themselves to the teacher.

(*To be continued.*)

[*From Photography.*]

THE STUDY OF NATURE.

BY H. P. ROBINSON.

THAT art is not a mirror-like imitation of nature is admitted by all artists, both orthodox and heterodox. That to become art the representation of nature must be more or less conventional, is also argued *nemine contradicente.* The orthodox painter has his laws and rules deduced from the practice of ages, and the impressionist and naturalist have equally strict, if not more stringent laws, which they have made even unto themselves, and made their pictures the most conventional efforts of pictorial art ever produced. Yet however much different schools of art may vary in their conventions, they all agree that the science of all art is in nature. Some think that the most beautiful nature makes the best art, others that the ugly is the most suggestive and gives the best pictures. It is possible that all are right in this degree; it depends, perhaps, on the quality of the artist. If some of our modern painters have not succeeded in convincing us that great art is to be got out of music halls, it is certain that some of the Dutch artists succeeded greatly with some even more disgusting subjects. The difference between their procedure is that the music-hallers employ a convention which they persuade themselves is close to the nature they see, that is, that they constrain themselves to see the nature while the Dutch used a convention by which the art was hidden from all but experts, and experts obtain a good deal of their pleasure from these productions by discovering the extreme skill with which the convention is used to give the best representation of nature and to hide itself.

The word conventional is used as a term of reproach by some recent naturalistic writers on art, who seem to forget that true art consists of many little conventions approved by experience, while their own depends on one great artifice which has not yet received the stamp of general approval. There is a certain something called "æsthetic pleasure," of which the naturalists are never tired of talking; this they consider the aim and end of art, and they insist that nothing more shall be demanded of a picture. It must not be moral or didactic; it must not tell a story or it would become "literary art," which they hold in peculiar abhorrence. This æsthetic pleasure is derived almost entirely from a knowledge, not that a picture is a close representation of nature, but that it has been carried out according to their own exclusive convention.

How mysterious are the ways of art! Naturalism was put forward as a protest against conventionalism and has resulted in the greatest convention known to picture-making. The recipe for manufacturing a naturalistic picture is quite simple: Suppress details and be dull. For photographs of this kind it is not finally decided whether the use of a lens is necessary. One authority insists that a lens is imperative, another has shown that he can satisfy himself without one. So doctors differ. It is not true, as is sometimes affirmed, that these pictures are never taken in sunlight; a close observer may detect cast shadows in some of them, but however brilliant the scene the convention demands that they shall all have the same somber expression, which, like the sauce in a not-made-in-France French restaurant, gives the same flavor to each dish.

All this leads up in a roundabout way to what I want to say.

As I have already pointed out, all artists agree that the only science and inspiration of art is nature, and that the closer we get to her, so that we do not neglect the art we employ in representing her, the better. It must follow then that the more an artist knows of nature the better, even if that knowledge does not immediately bear on the work he may have on hand. Now what do we find of this general knowledge of nature among artists? Let us contrast one of the old school with one of the new. It has been my good fortune to know many of the former, and a few—they are not so plentiful—of the latter. I have also had the pleasure of spending much time in the country with some of them. The broad result of my observation is that the old school delight in a minute study, examination and understanding of nature, while the new

school purposely avoid, and shut, or half shut, their eyes to more than one phase of it.

The first shall be an old friend who has studied art for many years and is now one of the most popular painters in the land. To spend a spring or summer day in the country with him is a liberal education. To him all knowledge of nature seems instinctive, and it bubbles from him as from a spring; not as a lesson, but as a delight. There is not a wild flower he does not know; a bird-note he does not recognize. He discourses on bird and beast and fish, not as a scientific vivisector, but as a lover. He knows their times and seasons and when to find them; what they feed upon; which one harmful and which one beneficial to the farmer and game preserver. In country places where he visits, the old traditions as to the injurious habits of certain birds and "vermin," which have been matters of faith for generations, have given way before beneficent knowledge, and the owl and kestrel are no longer nailed as felons to the keeper's kennel. The wiser knowledge he has spread has saved an innocent bird from destruction, and Mr. Velveteens now takes as much pride in showing rare creatures on the wing as he formerly did in crucifying their grisly corpses on his wall. It is a pleasure to sit by the rippling stream with our friend and talk of fish and fishing and angling entomology; the strange changes in the insect life on which the trout and grayling feed. Moths and butterflies are intimate friends of his, and he recognizes the portend of the red sunset and knows why

"The hollow winds begin to blow,
The clouds look black, the glass is low;
The soot falls down, the spaniels sleep,
And spiders from their cobwebs peep."

Now let us turn to the artist of the new school.

"I don't know a buttercup from a butterfly," said an eminent impressionist to me one day, contemptuously, as we walked through the fields. "May I long be kept from any such useless knowledge! Such petty details would interfere with my impressions of nature." And then he half shut his eyes, turned his head aside, and went into raptures on the tones and values of a very common-place bit of meadow and hedge, turning his back on a lovely sunset which was too garish for him—there was none of the pathetic sadness of low tones about it. The declining sun was beautiful enough for any common fellow to enjoy, but there was a subtlety of inner meaning in it, such as the naturalists find in the melancholy impressions that soothe their poetic souls.

It would not be fair to say that all of each kind are alike, it would be even untrue. Dr. Emerson, for instance, is a student of nature apart from tones and values; but the two I have described are certainly typical of the two schools according to my experience, and that experience bears out the truth of the old saying, that "none are so blind as those who won't see," and I do not wish to be contradicted when I say that the man who knows most, sees most, and enjoys most, is best prepared to paint pictures. The artist should see nature with the eye of an eagle and paint it with the poet's vision.

There is an obvious suggestion here: If it be true, as is generally admitted, that the eye sees only what it brings the power to see, may not this be some explanation of the impressionist phenomenon? Those who know little of nature see little of nature, hence the desire for suppression of detail.

It must be admitted that an intimate knowledge of nature may not be so generally useful to a photographer as to a painter. Ignorance may allow a painter to make many mistakes, of which the nature of his art absolutely prevents a photographer from being guilty. It is true here that "Art may err, but Nature cannot miss." A painter may paint blooming hawthorn in a picture representing "May Day," which would be untrue, as the blossoming "May" does not appear until long after the first of the merry month, and nature would rebuke the photographer

who looked for the blossom so early. This would be, perhaps, a trivial mistake, an anachronism in a fortnight or so, but I have seen paintings containing the flowers of all seasons mixed together, and, as Shakespeare says:

> "At Christmas we no more desire a rose,
> Than wish a snow in May's new fangled shows;
> But like of each thing that in season grows."

A closer study of nature may teach the photographer many useful things in his art, such as how to use a suitable sky to his landscape—a simple matter that always seems to be going wrong.

Finally, a better acquaintance with nature would help those critics, if they cared to be helped, who now glimpse only at nature and evolve truth from preconceived ideas, or from their inner consciousness, to creep a little nearer to facts; it would enable them to decide with greater authority how to use their favorite words, untrue and true, inner meaning, grasp, culture and subtlety of tone. They would learn that nature had not one melancholy mood or expression only, but that she assumes so many forms and moods that a long life would scarce suffice to read her correctly; that she is full of apparent inconsistencies and perplexing paradoxes that mock the wisdom of the wisest. Moreover knowledge would teach them whether a thing was so because it seems so, and would also teach what to them would be, perchance, the direct lesson—humility.

[*From the British Journal of Photography.*]

COPYING BOOK ILLUSTRATIONS AND OTHER SIMILAR SUBJECTS BY ARTIFICIAL LIGHT.

BY T. N. ARMSTRONG.

(*Continued from page* 698.)

IV.

In my previous article I referred to the importance of modeling or working up the subject to be copied (when such was of a nature as to permit of same being done), and perhaps next in importance to this working up of the picture itself comes the modeling of the negative, and here there is a wide field open for an enthusiastic worker to act upon. Undoubtedly very much may be done in the way of obtaining contrast or vigor by having recourse to a reliable method of intensification. In my practice on such subjects as are merely black and white I invariably intensify; but in numerous cases of copying ordinary photographs I seldom have recourse to such; for when a good negative of such a subject, say, as a portrait has been obtained, and the same is sufficiently plucky and full of middle tints, intensification would do more harm than good. But there are very many subjects where intensification stands pre-eminently out, and when used with proper judgment it places a great power in the hands of an operator for obtaining superior results. It must not, however, be supposed that every subject is best treated with intensification.

Having, therefore, after due deliberation, made up one's mind to resort to intensification, the operation must on no account be hurried. First of all the negative must receive a most thorough washing, when the ordinary bichloride of mercury solution may be applied with good effect, and when the film has assumed a cream-like color, the negative must again be subjected to a thorough washing, and provided the operator has at hand a good, broad, camel-hair brush, the same may, with good effect, be brushed firmly over the face of the film. I quite believe it is at this juncture that beginners make so many failures in intensification; they do not wash thoroughly before and after the application of the mercuric chloride solution, but become over-eager to get the job finished. Provided such a formula as I have referred to in my previous articles has been used for development of the plate, when the film that has now become

bleached with mercury and washed receives a bath of weak ammonia and water, the negative will assume a beautiful black color, and in cases where the subject copied has been a black and white one, the transparent parts will be but little clouded or removed from clear glass.

I will now relate a method which, in my hands, has proved most serviceable in cases where it is desired to obtain good white margins without blocking up the details of the subjects. The method I am about to relate I am not aware has ever before been made public by any writer. I can certify to its great advantages when working on some class of subjects; and as I write, I just remember a particular case which was so treated with excellent results. The case in question was when a number of lithographic prints of locomotives were sent to me to copy and make lantern slides from; but little time was permitted for the work, so I could not use collodion, and had to have recourse to gelatine and artificial light for the making of the negatives. Mawson & Swan's photo mechanical plates were used, and all the operations of exposing, etc., were carried out much after the lines laid down by me in these articles; but when I came to the intensification stage I saw at once that were I able, after the plates were intensified, to remove from such portions of the negative the atoms of mercury that had been added to the metallic silver deposited by development in such places as would have been better left unintensified, and leave those parts only, such as the whites, in the picture intensified, I would improve matters to a very appreciable extent; and this is how I went about it. After a good washing, and before the negative was allowed to dry, but after the superabundant water had been drained from the surface of the film, I placed the negative in an old printing frame, one large enough to allow of its being held up at the four corners by books of similar thickness; the printing frame being a large one, and containing a sheet of glass, allowed the negative to lie flat, under which a sheet of white paper was placed to act as a reflector, the light coming in at the four sides between the books; in other words, I extemporized a flat retouching desk. I then made a clean, fresh, saturated solution of hypo, and taking a new clean camel-hair brush of small size, I first of all went carefully round the edges of those parts of the negatives that it was desired to remove the mercury from; in doing this the brush should not be overcharged, but just nice and damp; it soon made its presence felt, and the atoms of mercury disappeared as if by magic. The entire surface of the picture which was wanted to be so treated was then brushed over in a similar way, and a most distinct advantage gained by leaving those parts only intensified that were benefited by such. The one thing to avoid in this treatment is the running of the hypo solution beyond the parts it is desired to treat; if the negative is placed flat and the brush not overcharged with hypo, there will be found but little trouble, and even should there be a slight overflowing in a few places, this is easily put right afterwards by a slight application of Chinese white when the negative is dry. An ordinary retouching desk is not nearly so useful for this dodging, for with its aid any superabundant flow of hypo solution is very apt to flow down the face of the negative and cause trouble and loss of temper; there are many other ways in which this dodge is most useful in improving negatives that are to be improved by merely intensifying some parts only, such as thin skies. Another class of subjects which are also conveniently treated in this way is the copying of coins or medals, or many of the numerous articles met with in commerce, and which it is frequently desired to photograph.

WITH a little ingenuity a winter scene can easily be extemporized, and without any considerable outlay, a little whitewash, or white paint, judiciously applied to any old landscape background, a few pounds of cotton wool for the accessories, and some sheets of white wadding for the floor, being all that is required.

THE BULLETIN becomes of more interest to me with each year. I have it bound in yearly volumes, which makes it of even greater value to me. O. T. DAVIS.

PHOTOGRAPHIC METHODS OF OBTAINING POLYCHROMATIC IMPRESSIONS.

BY LÉON VIDAL.

[Read before the Photographic Society of Great Britain.]

(*Continued from page* 700.)

ON the other hand, plates which have been sensitized for red by means of chlorophyll, cyanine or methyl violet, are insensitive to green. If, therefore, the subject contains also an abundance of green (as well as red) it would be impossible to render it accurately by means of a plate sensitive only to yellow and green. (Blue and violet act only too energetically, and with regard to them we need only say that their action must be moderated by means of a yellow screen.)

One would also fail to obtain a good result with a plate sensitized only for red and yellow.

If, therefore, one does not possess plates which have a suitable degree of sensitiveness for all the colors, it is recommended that orthochromatic plates already sensitized for yellow and green be used, and that they be further treated with methyl violet, according to the formula given by Wellington in the *Photographic News* of 1885. We thus obtain plates which are sensitive to yellow and green and also to red. (A colored slide of a bouquet of flowers and slides of the three monochromes were shown in the lantern. The red monochrome was prepared by photographing the subject on a Lumiere plate sensitive to the yellow, a yellow screen being used; the yellow monochrome by using an ordinary Lumiere plate without a screen, and the blue monochrome by using a Lumiere plate sensitive to the red, a reddish orange screen being employed to cut off the blue rays.)

Since the object is to correct the inaccuracies due to ordinary plates, it is necessary, at the outset, to have a clear idea of the subject to be copied, so as to select a suitable method of orthochromatizing the plates. The example just given shows clearly the line to be followed, and it is evident that if the subject only contains blue, yellow and green, and combinations of these three colors, it will be sufficient to use a plate sensitized for yellow and green.

The eye can judge very well of the relation between the tints of the copy and those of the original, and if the correction above referred to be not satisfactory, one can alter the formula or the screen, and prepare a second negative which shall be nearer the truth. A few trials are of little account when it is a question of doing a piece of work satisfactorily. We insist greatly on the pains which it is necessary to take in the preparation of the negative, because it is on that part of the work that the final result almost entirely depends.

It is easy to see, for example, that if the red has not sufficiently acted upon the plate, the latter will be too transparent in the corresponding portions, and the color lying beneath will be smudged. The tonality must be accurately rendered to avoid this defect.

The negative having thus been obtained under suitable conditions, it now remains to produce the colored effect. Several photographic methods may be used, but the two which are especially suitable are collotype and Woodburytype.

As regards the colors lying beneath, we think that chromo-lithography is the method which is of most commercial value.

If the final printing is to be done by means of collotype, the following is the procedure: A collotype plate is prepared from the negative, and is inked in with thin red or blue ink, and impressions are taken on transfer paper equal in number to the different colors which one wishes to use. These impressions are transferred to as many grained or polished lithographic stones.

The lithographer thus has a design absolutely identical with the original transferred to his lithographic stones. We omitted to recommend that two registering

crosses be drawn on the collotype plate with a solution of tannin or gallic acid. This coagulates the gelatine, or causes it to take the ink in the same way as the parts which have been exposed to light.

The separate stones are prepared as usual with black lithographic ink, after careful study of the original and of the transfer. In certain cases flat tints may be suitable, but the colors should be graduated to follow the original, which is an essential condition. The flat tint is in all cases necessary where photography has reproduced a color the brilliance of which is equivalent to pure white. Thus, if the original is a portrait of a lady wearing a black satin dress, the high lights produce in the negative intensely black effects, which in the positive become pure white. This is an inaccuracy which orthochromatic photography cannot correct. All that could be done would be to over-expose, a remedy which is worse than the trouble to be avoided, as it would produce a monotonous effect over the whole proof.

It is better to remedy this defect by means of a local flat tint. Black satin, even where it reflects the brightest light, does not appear to be a pure white; in order to be assured of this, one only has to bring near to it a piece of white paper. One will at once see beneath the color of the satin a sort of light gray color, which indicates the exact value of the flat tint.

It is necessary that the flat tint be under the whole of the design to which it refers. It will be just the same for all the other colors when they produce similar effects. Having finished the color-stones and the collotype, we proceed to take a proof. It is even better to pull first a light collotype print on white paper, and then to print the colors on it. The first proof serves as a guide, and one ends nevertheless with a collotype impression of the required tone and color.

This first attempt, which will itself be very pretty—thanks to the irreproachable accuracy of photographic processes—may require slight correction with regard to the distribution and combination of the colors. This, however, is easy, and it will rarely be necessary to make a third trial.

This is, in short, chromo-lithography, in which photography has taken a leading part and done the most difficult portion of the work, giving effects which could only have been otherwise obtained by the employment of highly skilled artists, who would have interpreted the original rather than copied it.

(As examples, colored fac-similes of Gobelin tapestries representing (1) An Audience of Louis XIV and Cardinal Chigi, and (2) The Triumph of Bacchus, were shown, and also the original collotype of the latter.)

This method can be applied to all colored subjects which contain no metallic effects. When the latter are present this method fails. Greasy inks, being wanting in transparency, do not lend themselves to the reproduction of metallic subjects. They smudge the surface and reduce the brilliancy, and fail entirely to convey the impression given by the metallic object itself. Only a vitreous ink will suit in this case, and the only method which will give good results by a mechanical process is to prepare Woodburytype prints with gelatinous ink.

For the preparation of the underlying color print are used not only metallic powders—gold bronze, silver bronze, copper bronze, etc.—but also thin leaves of either bright or dull metal, which give more brilliancy, more metallic solidity and truer effects. They are applied to the paper by means of lithography, but the paper should be prepared in the method suitable for the Woodburytype process. The impressions are taken on the colored print, making use of registering marks in the same way as in chromo-lithographic printing. At first sight this seems difficult, but the manipulative skill is easily acquired, and the register is perfect. We have in this way prepared beautiful prints, which could have been produced by no other method.

The examples shown to illustrate this part of the paper were—

1. The chromo-lithographed portion of a Limoges enamel, and the same with the Woodburytype superposed on it.

2. A Woodburytype from a Limoges enamel representing the "Toilet of Psyche," the colored design of the same and the final result obtained by their superposition.
3. The Woodburytype of a jug, and the complete picture obtained by superposing this on the colored design.

For a limited number of impressions the carbon process might be used; but here we are leaving commercial methods, and therefore we shall not consider it in detail.

Composite Photochromy.—We borrow this name from Mr. Ives, of Philadelphia, although he gives to it a more theoretical meaning.

In this method the various colors are not interpreted by the eye, but are combined by allowing photography to carry out the required selection automatically, and preparing, by means of special negatives, the various monochromes, which, when superimposed, reproduce the colors of the original. This method is somewhat complicated, and the photographic part of the work presents serious difficulties, because of the infinite variety of tones and tints, and the almost theoretical precision with which it is necessary to work in order to arrive at satisfactory results.

There are two distinct series of operations: first, the preparation of the negatives, and secondly, the printing of the monochromes by whatever method is chosen. Typography, lithography and collotype are the most suitable. Woodburytype may in this case also be reserved for the final printing on the proof required to give metallic effects.

Many different suggestions have been made with regard to color selection by photography. The principal writers who have considered the question are Henry Collen, Cros, Ducos-du-Hauron, Poiré, Abney, Vogel, Stolze, and lastly Ives, who at the present moment is publishing important and remarkable works on this question. From all these researches, carried out by eminent investigators, we must endeavor to deduce some practical or commercial conclusions.

It is more important in this method than in simple photochromy to orthochromatize the plates, because it is necessary in the case of the refractory colors not merely to obtain the corresponding values, but even to exaggerate their actinic effect. The red, for example, ought not merely to act upon the plate so as to produce a tint corresponding to its luminous effect; it should produce the same effect as white. Thus a red flower ought in the *cliché* corresponding to the blue monochrome to have the appearance of a white flower.

Up to the present time, having read, and tried experimentally, all that has been published on this subject, we have come to the conclusion that color selection by means of three negatives, each intended to eliminate two of the primary colors, does not give an absolutely accurate result. Taking each color in turn, we wish first to eliminate all colors other than yellow; or, in other words, to obtain a negative which will produce the yellow monochrome. Even admitting that the three primary colors (yellow, blue and red) are sufficient to reproduce by their combination all possible colors and shades (and of this we are very doubtful), it would be necessary to eliminate successively all the colors of the subject which are not yellow, and which are not blue, and which are not red; and this is a thing which cannot be done completely.

As regards the negative belonging to the yellow monochrome, it is clear that it ought to reproduce equally all the red and all the blue, and to leave the yellow, and combinations of the yellow, with other colors represented by clear glass. A method of arriving approximately at this result is to make use of an ordinary gelatino-bromide plate. The action of the blue is of course extremely energetic in comparison with that of the yellow. The difference in effect thus utilized will give the yellow monochrome, but with the result of reproducing yellow wherever the original subject contains red. The employment of carmine instead of vermilion when printing the colors will permit the yellow to be utilized for obtaining vermilion by its combination with carmine.

Thus we obtain one negative which is fairly exact, although it does not completely separate two colors from the third.

We will now consider the negative corresponding to the blue monochrome. This one should separate out the red and the yellow—that is to say, it ought to receive from the blue color, which is so powerful, hardly any impression, while the yellow and the red, which are so little actinic, ought to give the effect of white. The method of obtaining this result is to employ an orthochromatic plate, which is sensitive to green, red and yellow, exposed behind a reddish orange medium. The blue is to a large extent cut off, while the yellow and red rays pass through. The length of exposure is naturally considerably increased, but a few minutes' additional exposure are of little importance when photographing inanimate objects. For all practical purposes the negative gives fairly accurate results.

The third negative corresponding to the red seems a simple one to prepare by means of an orthochromatic plate, sensitive to yellow and used without a screen. Evidently it is not necessary to restrain the reds, which produce but a very moderate effect. The blue and yellow will produce a powerful effect, and the required color selection will take place automatically.

If from each of these three negatives we prepare a collotype print in its corresponding color, and superimpose these three monochromes, we shall see in most cases that we are far from the desired result. Theoretical accuracy is far from being attained, the number of monochromes is insufficient. To produce results of commercial value we must use at least four *clichés*.

The fourth *cliché* should be obtained with an orthochromatic plate sensitive to green, yellow and red, using a yellow-orange screen to moderate the blue and the violet. This *cliché* gives a body to the work, which would be incomplete with the red, yellow and blue printings only.

(*To be continued.*)

OBITUARY.

WILLIAM NOTMAN.

ANOTHER veteran has passed from the ranks of photography. It was only a few days before his death, on Wednesday November 25th, that we had the pleasure of talking with this genial Canadian photographer in New York City, and little thought from his looks that the scythe of the grim Reaper was perhaps then raised to mow him down. Mr. Notman was one of the best exponents of the photographic art upon the western continent, and every member of the fraternity will feel that a pillar of the craft has gone from amongst us. We extend to his bereaved family our sincere sympathy and condolence. Below we give an extract from a Montreal paper showing the esteem in which he was held by those who knew him best:

"By the death of Mr. William Notman Montreal loses one of her distinguished citizens. He was born in Paisley, Scotland, on the 8th of March, 1826, and came to Montreal in 1856, when he went into the dry goods business of Messrs. Ogilvy, Lewis & Co. He had previously been an amateur photographer, fond of the art, and full of enthusiasm for it. Soon he determined to make it his profession, and he began in a small way, his modest gallery being at that time but little known. It was not long, however, until he had achieved great local distinction as an artist in photography, and soon the fame of Notman's photographs spread over Canada, to the United States, and even to Great Britain and the Continent. How many will recollect Notman's studio, who were wont to say they never had been so well suited elsewhere! How artistically photographic pictures were grouped need not be here described. Mr.

Notman was singularly modest and unobtrusive, paid close attention to his business, but was well informed in the events of the day, and quick to note their trend. He had a good deal of the thoughtful deliberation of the Scotsman without quite reaching the point known as 'canny,' and was always friendly and cheerful in conversation. In his opinions he was decided, and even tenacious, but only after he had thoughtfully considered matters Like many Paisley men, he put fair play uppermost. Attention to business was his ruling characteristic. He refused to take rest, insisting upon going to his establishment, even after the cold which fastened, as it proved fatally, upon him had progressed considerably. It was not until after Saturday that Mr. Notman's case developed fears that his recovery was impossible. He had been ailing several days previously, but had been up and moving about the house on Saturday evening. The worst was feared on Monday, and in obedience to telegrams his absent relatives came hurrying homeward, his son George, from New York, arriving too late to see him alive. His son Charles, who was then at Halifax, is on the way to Montreal.

"The firm of Notman & Sons has two branches in Boston one in New York, one in Halifax, and one in the Windsor Hotel, Montreal, his Bleury street establishment being the parent house. Nearly every distinguished stranger that has ever visited Montreal patronized Notman's, and their galleries of pictures form of themselves a most pleasant feature of our city. While deeply engaged in his own business, Mr. Notman was public spirited, too, and was a leading factor in building the Windsor Hotel. He was a member of the first Windsor syndicate. He was also active in securing the city an art gallery, which profited from his efforts. To say that Mr. Notman was highly respected is not necessary in this community. Those acquainted with him cannot but feel that his death is the loss to our city of a man great in his profession. He leaves three sons and two daughters."

A TESTIMONIAL TO DR. R. L. MADDOX FOR HIS DISCOVERIES.

As will be seen by reference to the letter of our correspondent in "English Notes," a fund is being raised for a testimonial to be presented to Dr. Maddox as an acknowledgment of his services to photography in publishing his method for the preparation of gelatino-bromide dry plates. It is now twenty-one years ago since this process was published free to the world and it is thought to be a fitting time to honor the man who has done so much for the modern photographic art. Dr. Maddox is now advanced in years and is suffering from disease ; any help now given will serve to soothe his declining days, and be much more like practical humanity than putting up a monument to his fame when he has passed from his labors amongst us.

A strong committee has been organized in England to take charge of money subscribed for this fund, and any of our readers who care to send contributions to us will find them acknowledged in the BULLETIN, and we shall take special pleasure in transmitting them to the right authorities.

OUR ILLUSTRATION.

THE handsome frontispiece of this issue of the BULLETIN is from the studio of New York's well known artist, Dana. The charming subject is too well known to need introduction from us, and that harmony reigned between both artist and subject is evident from the striking and life-like effects seen in the picture. We may truly say a worthy subject for a worthy artist, and *vice versa.*

ANTHONY'S
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THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held on Wednesday evening, November 11, 1891, with *Vice-President* JOSEPH H. BURROUGHS in the chair.

The Secretary announced the presentation to the society, by Mr. J. C. Browne, of a copy of "Reports of Observations of the Total Eclipse of the Sun, August 7, 1869, by Professor J. H. C. Coffin, U. S. N."

The Board of Directors reported the election of Messrs. Frank Bennet and Cyrus Chambers, Jr., as active members of the society. They also announced the death of Mr. Frederick A. Walker.

On account of the alteration and improvement to be made in the meeting-room, the Annual Honor Picture Exhibition will be postponed until January, and will be held under revised rules shortly to be issued.

Mr. Stirling offered a resolution to amend the By-Laws, so that Section 2, Article II shall read:

Active members shall pay the treasury $10 annually in advance. The fiscal year shall commence on the first day of January, but members elected on or after the first of July shall pay but $5 for the current year in addition to the initiation fee.

Mr. Casper Miller read a paper on "Preparing Ferrous Oxalate Developer." (See page 716.)

Dr. Mitchell suggested that an addition of 10 to 25 per cent. of glycerine to the developer would tend to retard oxidation, and it was very often used in developers of that character. Sugar was also used by some for this purpose. There was nothing in glycerine that would at all interfere with any photographic process that the developer might be used for.

Mr. James Wilson exhibited a new shutter for instantaneous or time work. It was copied from an English invention known as the Sargent shutter. It was very compact and could be placed even between combinations of the lens or over the hood. The slide had an up and down motion similar to that of the Newman shutter.

Mr. Earle exhibited several instantaneous views of athletes taken with a hand camera by Mr. Hemnent, of Brooklyn. These he thought were remarkable for the wonderful brilliancy in the shadows and the amount of detail. They were 4 x 5, taken with a Prosch triplex shutter, and for instantaneous work he had never seen them excelled.

Mr. Earle also showed a new mount, intended to take the place of the ordinary card mount with its mat accessory. The specimens exhibited had a mat border with a plain smooth center, on which a buff tint had been printed. They were made by the A. M. Collins Manufacturing Company, and were adapted particularly for platinotype or other mat surface prints. The smooth center was produced by severe pressure.

The chairman here announced that the competitive exhibition of lantern slides from hand camera negatives would be given, and appointed Messrs. Pancoast, Browne and Castner as a committee to judge the slides.

After the exhibition, the committee decided that the honors of the occasion were due to set H, by Mr. W. H. Rau, Mexican scenes taken by him with a Scovill hand camera on glass plates, basing their decision on the difficulty of the subject and the technical quality of the pictures.

The slides selected to represent the society in the American Lantern Slide Interchange for the season of 1891–92 were exhibited, after which the meeting adjourned.

ROBERT S. REDFIELD,
Secretary.

TOLEDO CAMERA CLUB.

WITH the closing of the Bausch & Lomb contest, the judging of the negatives, and the awarding of the lens, the Toledo Camera Club made quite a social event of it. Four hundred invitations were issued, and on Friday evening, November 20th, from 7 to 10, the rooms of the club were crowded to their utmost capacity. Upon the walls were suspended boards of various designs, containing prints made with the Clark prize lens. At one end of the room was placed a long table in the center of which was the Club Slide Lantern; around this were arranged about fifty hand cameras, labeled, "Our Battery." At each end of the table were stacked the Tripod Cameras and Club apparatus. In the center from the ceiling swung the prize lens and shutter, decorated with blue ribbons. The dark room, which was lit only with red light, was a continual source of attraction as well as mystery, especially to the ladies. Freeman's orchestra rendered music for the evening, and everything went as merry as a marriage bell. About 8.30 P.M. the President called the members to order, when W. F. Van Loo delivered the decision of the judges, which was based upon the following understanding of the contest, namely: "The best negative of an instantaneous exposure." He stated that their first duty was to determine what was instantaneous, by the facts appearing in the negative. The answer given by the Bausch & Lomb Optical Company to the question is, "anything that shows life in the negative." The word "life," from a photographic point, and as here used, means objects in motion, and the same construction was put on its definition in this contest. The judges complimented the club on the merit displayed in the negatives submitted, and regretted that it was a contest of the lens instead of the operator, and under the above ruling were obliged to lay aside some very fine negatives which lacked the necessary proof of "life." The contest was therefore confined to negatives submitted by F. C. Wade, M. A. Martin, E. L. Griffith, and decided in favor of a street scene by F. C. Wade (size $6\frac{1}{2}$ x $8\frac{1}{2}$), said negative being larger, thereby showing greater capacity, equally sharp and well defined, and of better printing qualities. The judges were D. L. Stine, W. F. Van Loo and W. E. McKecnie. Nine members competed. Forty-two negatives rendered. Although but one year old, the Toledo Camera Club has fifty members and promises to make one of the strong social organizations of the city. From beginning to end the reception was pronounced by all a most successful one.

YONKERS PHOTOGRAPHIC CLUB.

THE annual meeting of the Yonkers Photographic Club was held at Hawthorne Hall, Monday evening, November 23d. The club has a membership of forty, and is in good financial condition.

The officers elected for the ensuing year are: George B. Ritter, President; J. Fowler Trow, Vice President; Edward T. Sherman, Corresponding Secretary; Robert M. Reevs, Recording Secretary; Gustav G. Schlueter, Treasurer. Captain Bragg and George B. Wray, with the officers, comprise the Executive Committee.

Mr. Reevs received a vote of thanks for his recent generous donation of books to the club. This consisted of seventy-five volumes.

Next Monday evening, John W. Rusk, of New York, will lecture before the club on the subject of "Aristotype Paper," and will demonstrate its working.

SPRINGFIELD CAMERA CLUB.

THE reception of the Springfield Camera Club held at Gill's Art Galleries November 14th in connection with its fourth annual exhibition passed off with delightful informality, it being the unanimous opinion that the display was in every way far in advance of all previous efforts of the organization. The Springfied Guitar and Banjo Club was present with tambourine and bone accompaniments, and rendered capital music. The club may well be proud of its achievements. Organized in the autumn of 1886, the members met for a year at their own homes and exchanged photographic papers on the plan of a periodical club, the start being made with a membership of scarcely a dozen. The club gained much of its early impetus from the late George M. Barney, who was an enthusiastic amateur. F. A. Nickerson, W. P. Draper, L. J. Powers, Jr., N. P. A. Carter and John D. White of Chicopee were the other prime movers in the affair. The late Mr. Barney had several fine sets of apparatus, which proved especially helpful during the early days of the society, when many of the meetings were held at Pecowsic. After a little more than a year had passed quarters were secured over Brewer's drug store and conveniently fitted up, and since that time progress has

been rapid. The plan of field days was early inaugurated and now Labor and Memorial days are regularly set apart for jaunts among picturesque country nooks. Occasionally these trips are taken in the company of other clubs, such as the Hartford Society, and already the charming scenery about Middlefield, Becket, Whately Glen, Huntington and Lanesboro, Conn., has been reproduced by almost every member of the club. A year ago the club joined the New England Lantern Slide Exchange, with which the seven or eight other New England camera clubs are connected, and admits the privilege of examining each other's slides monthly.

During the past year prize lens contests have been carried on also, one for illustrations of Tennyson's "Brook" on a plan similar to that pursued with Whittier's "Snow Bound" last season. For this year's exhibition a neat illustrated catalogue has been issued as a souvenir, giving much information about the organization. M. D. Fletcher has drawn inspiration chiefly from Berkshire County and Forest Park, and has managed to catch the spray effects of half a dozen mountain brook cascades with exceptionally fine effect. W. P. Draper has, among others, a charming picture of Old Deerfield street in summer and six cards illustrating "Snow Bound," as has Hinsdale Smith, Jr. Mr. Smith also has a lifelike couple of youngsters, who have sought relief in a retired brook on a summer day, beside such speaking efforts as "The old Homestead," "Chicopee Meadows" and "In the Meadows." Charles McElwain has several notable pictures, such as "Still Waters," "The Ravages of Time" and "Under the Trees," while Miss Mary Janes has struck an uncommon bit in "Gladys Wants a Ride." Miss Mabel Bullard has several realistic views of the ice storms of last winter. J. C. Kematar has more than a score of fine pictures taken in the Adirondacks, Isle of Shoals, Old Orchard and other points. His enlargements will be found of especial interest, particularly the Grass River boathouse among the North Woods, on the porch of which several Springfield faces can be distinguished. "The Buckboard Ride" and "Moonlight at the Isle of Shoals" are among his best specimens. John Leshure has a striking picture in "A Shady Lane at Rowe" and pretty bits of scenery about Lanesville, Ct.

R. W. Adams has, perhaps, the best reproductions of the ice storms, gained from the vantage ground of Crescent Hill, and a score of Kodak snap shots taken while abroad. Charles W. Shaw's athletic bent is observable in his frequent choice of Hampden Park with its kaleidoscopic events as a subject. Chester W. Bliss has a snowy winter scene and two views at Russell, W. C. Marsh several creditable interiors and exteriors, D. N. Coates a number of aggravating Amabelish views, and M. A. Booth, of Longmeadow, a panel of photo-micrographs. Ralph W. Ellis has a frame of Duxbury views aptly styled "In the Footsteps of the Pilgrims." Miss M. Louise Stebbins has half a dozen pictures voicing the fantastic work of the Frost King; also a series of "cute" dogs. The Hartford club has sent a dozen pictures, "Under the Lea of a Grassy Bank" being particularly worthy of attention. The Providence club is represented; also the Lowell society, the work of whose members is uncommonly fine. "Getting in Oats" and "Moonlight Effect" are notably fine efforts in this list. The Mystic Camera Club, of Medford; the Photographic Society of Waterbury; the Worcester Polytechnic Institute; and the Camera Club of Portland, Me., are also generously represented, the latter society's glimpses of rocky shores and islets being of unusual excellence.

THE CHINA CAMERA CLUB.

Photographic Exhibition.

At a general meeting held in the club-rooms on the 10th June last it was resolved to have a Photographic Exhibition.

The Club Committee, aided by a sub-committee consisting of Messrs. E. Bois, E. Cooper and W. S. Percival, decided to have the exhibition in the Masonic Hall, on Friday and Saturday, the 3d and 4th December next.

Prizes consisting of one gold medal and fourteen silver medals will be awarded as follows:

A—One prize for the best single exterior timed view.

B—One prize for the best set of six exterior timed views.

C—One prize for the best single instantaneous view.

D—One prize for the best set of six instantaneous views.

E—One prize for the best set of miscellaneous views.

F—One prize for the best set of six lantern slides.

G—One prize for the best set of interiors.

H—One prize for the best single flash light.

I—One prize for the best composition or genre picture.

J—One prize for the best enlargement.

K—One prize for the best set of albumenized prints.

L—One prize for the best set of bromide prints.

M—One prize for the best print in any other process.

N—One prize for the best set of hand camera pictures, and a gold medal to be voted for by the members of the China Camera Club for the best collection exhibited by any member.

In addition a prize is offered to the best set exhibited by any member of any other amateur photographic society.

RULES TO BE OBSERVED BY EXHIBITORS.

Under Rule 11 of the China Camera Club: "In all competitions, developing, printing, toning, fixing and mounting shall be entirely the work of competing members."

The pictures sent in for competition must have been taken since January 1, 1890.

If a picture wins a prize in one class it is excluded from competition in other classes, but may receive an honorary mention.

Due notice will be given when and where the exhibits are to be sent.

J. MENCARINI, *Hon. Secretary.*

SHANGHAI, October 24, 1891.

PREMIUMS AWARDED AT THE SIXTIETH EXHIBITION OF THE AMERICAN INSTITUTE, NOVEMBER 28, 1891.

I. DEPARTMENT.

Group 2.

Judges: Dr. W. STRATFORD, T. J. BURTON, DAVID JOHNSON.

Photochrome Engraving Co., for Photochrome Engravings, Medal of Merit.

American Design Co., for Designs of Art Manufacturing, Medal of Merit.

H. Pazelt, Ocean Grove, N. J., for Engraving on Glass Ware, Medal of Merit.

Group 3.

George G. Rockwood, for Bromide Enlargements and Photographs burnt in on China, Medal of Superiority.

C. D. Fredericks, for Photographs, plain and n Crayon, Pastel and Water Colors, Medal of Superiority.

Frank Pearsall, Brooklyn, N. Y., for Knarfograph Portraits, Medal of Superiority.

E. C. Dana, for Photographs, Medal of Superiority.

Rudolph Wilhelm, for Photographs, Crayon Portraits, Water Colors and Pastels, Medal of Superiority.

James Inglis, Chicago, Ill., for Sepia Bromide Prints, Medal of Superiority.

G. Cramer Dry Plate Works, St. Louis, Mo., for Gelatine Dry Plates, Medal of Superiority.

American "Aristo" Paper Co., Jamestown, N. Y., for American "Aristo" Ready Prepared Paper for Photographic Printing, Medal of Superiority.

Mrs. W. A. Robinson, for Photographs, Medal of Merit.

N. E. White & Co., Brooklyn, N. Y., for Colored Glacé Portraits, Medal of Merit.

J. De Young, for Photographs, and Oil Pastel and Crayon Portraits, Medal of Merit.

Rizzio Oil Pastelle Co., for Portraits in Oil Pastelle, Medal of Merit.

A. Tanquerey, for Photographs, Crayons and Pastel Portraits, Medal of Merit.

William Shettle, for Pastel Paintings, Medal of Merit.

N. Y. Photogravure Co., for Reproductions by Photogelatine and Photogravure Processes, Medal of Merit.

Group 7.

Judges: Dr. W. STRATFORD, A. COOPER, Dr. J. R. MACGREGOR.

E. & H. T. Anthony & Co., for Photographic Apparatus and Supplies, Medal of Superiority.

The Scovill & Adams Co., for Photographic Cameras and Apparatus, Medal of Superiority.

Automatic Phototype Co., for an Automatic Phototype Machine, Medal of Superiority

Hetherington & Hibben, Indianapolis, Ind., for the "Prize" Magazine Camera, Medal of Superiority.

Student Camera Co., for Cameras, Medal of Merit.

EXHIBITION OF THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK AT THE 60TH FAIR OF THE AMERICAN INSTITUTE.

Judges: WILLIAM KURTZ, FRANK LA MANNA, HENRY A. FERGUSON.

Landscapes.

H. M. Grisdale, 113 West 38th street, for Frames Nos. 38, 39, 46, 52 and 53, Medal of Superiority.

Alfred Stieglitz, 14 East 60th street, for Frame No. 220, Medal of Excellence.

Hugo S. Mack, 69 West 46th street, for Frames Nos. 147, 164 and 166, Medal of Merit.

Marines.

Chas. Wager Hull, 111–113 West 38th street, for Frames Nos. 79, 87, 102 and 103, Medal of Superiority.

Ferdinand Ruppert, 901 Columbus avenue, for Frame 188, Medal of Excellence.

Portraits.

Chas. H. Davis, 316 East 150th street, for Frames B, D, 2, Medal of Superiority.

Instantaneous.

G. W. Wundrum, 316 Quincy street, Brooklyn, for Frame 273, P and Y, Medal of Merit.

Enlargements.

Louis H. Laudy, School of Mines, Columbia College, for Frame 110, Medal of Superiority.

Louis T. Brush, 27 West 31st street, for Frame No. 11, Medal of Excellence.

J. Stedman Converse, 27 West 38th street, for Frame No. 21, Medal of Merit.

Genre.

Miss Emilie V. Clarkson, "Holcroft," Potsdam, N. Y., for Frames Nos. 17 and 18, Medal of Superiority.

Interiors.

Fred. Vilmar, 59 West 51st street, for Frame 263, Medal of Excellence.

Recommended for Honorable Mention.

Edward Leaming, 18 West 38th street, for Examples of Different Methods of Sensitizing and Toning upon Various Papers, Frames Nos. 120 and 139.

A. L. Simpson, 1271 Broadway, Frame No. 205.

Charles Wager Hull, 113 West 38th street, for Cloud Effects, Frames 94, 95 and 96.

Bibliography.

DIE CHEMISCHEN WIRKUNGEN DES LICHTES, von Dr. Josef Maria Eder. Halle a. S.: Wilhelm Knapp, 1891.

This handsome volume on the chemical action of light by Dr. Eder has been on our table for some time, but the crowded condition of the pages of the BULLETIN has prevented us from taking notice of it before this time. It forms the second part of the author's well known Handbuch der Photographie and covers over 300 pages of large octavo printing. In it the author takes up the relations of light to heat and electricity from a chemical standpoint, the sun spectrum and its chemical action, the action of coloring matters and media in relation to photography, the sensitiveness of different photographic preparations, the relation of photography to meteorology, photography of the sun, moon and stars, and photometry and the chemical action of light rays and their relation to photographic preparations.

From the above it will be seen how large a field the author covers, and it is needless to say that it is done well. The volume is full of the most valuable references and tables, and will prove a very important addition to the literature of photography. We only regret that we cannot give our readers extracts from the work to show how important the researches therein recorded are to the student of photography.

THE AMERICAN ANNUAL OF PHOTOGRAPHY FOR 1892. New York: Scovill & Adams Co.

This well known annual is again before us. The illustrations are well up to the standard of the modern photo-mechanical processes, the pages are crowded with articles from a wide range of contributors and cover an equally wide range of subjects. We tender our best thanks to the publishers for sending us this new volume.

PHOTOGRAPHY APPLIED TO THE MICROSCOPE. By F. W. Mills. New York: E. & H. T. Anthony & Co.

This is a neat little volume devoted to the use of the microscope in conjunction with the camera. It is well written, the directions are such that those with a limited amount of experience can understand the manipulations. The work is pre-eminently fitted to the wants of the microscopist, for whom it was especially written. It is well illustrated and nicely printed, and in the compass of its sixty odd pages contains all that is necessary to learn the application of the camera to needs of the microscopist.

DIE ELEMENTE DER PHOTOGRAPHISCHEN OPTIK, von Dr. Hugo Schroeder. Berlin: Robert Oppenheim, 1891.

This is a highly mathematical work on the construction and proving of lenses. We fear there are few outside the opticians that would be interested in the volume; but it is well worthy of study by all who wish to understand the application of scientific optics to lens construction. The work is well illustrated with diagrams, and not the least valuable part of the book is a very complete list of the literature on the subject. The subject is treated from the geometrical side of optics and covers over 200 octavo pages. We are pleased to have so well written and valuable a volume in our photographic library.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—H. L. S. writes: Would you please inform me how to prepare an A No. 1 bichromate of potash, gelatine solution, such as is used in coating a copper plate in "photogravure"?

A.—A fairly good formula is to coat with a gelatine solution—

Gelatine	3 ounces.
Water	50 ounces;

and after setting, sensitize with a bath of

Potassium bichromate	1 ounce.
Water	15 ounces.

Or you may mix the gelatine with the bichromate, using not over forty grains of the latter to every ounce of the gelatine mixture.

Q.—L. K. writes: Please tell me through "What Our Friends Would Like to Know," how much of the following—

No. 1.

Dry chloride of lime	2 ounces.
Water	30 ounces.

No. 2.

Carbonate of potash	4 ounces.
Water	10 ounces.

Mix, boil and filter—should be used to each quart of fresh water, for eliminating hypo from albumen prints. How long should they remain in it?

A.—The amount of water that you may add to the filtered solution will largely depend on the quality (strength) of the dry chloride of lime. If the latter is good you can dilute one volume of the filtered fluid with four or five volumes of water.

Q.—J. F. C. writes: Do the toning powders work with a gold and sodium solution the same as a pure chloride of gold solution? I used them according to directions, using gold and sodium, and the prints turned pink on the back and toned very slow, although I made the bath about triple strength. I am sure everything was clean. 1. Would it be caused by having a too strongly alkaline bath? 2. Ought I to use the pure chloride of gold with them, according to directions? 3. How can I use the gold and sodium stock solution with them?

A.—The toning powders work well with any kind of gold salts, provided they are pure. With gold and sodium chloride it takes a little more of the gold salt than if pure gold chloride is used. If the bath is too alkaline the toning would be rapid; it is probable your bath is too cold. Heat to 100 degrees Fahr. and try again.

Q.—A "Country Artist" writes: I am a subscriber for the BULLETIN. Would you be kind enough to tell me how the picture of Miss M. Wainwright is printed, on such clear background—is it vignetted or how? Please answer in the BULLETIN if you have no time otherwise.

A.—The negatives are all made in the usual way, but with white backgrounds. Under these circumstances, great care has to be taken in the management of the light upon the sitter and also in developing the negatives, otherwise the pictures are flat.

Q.—T. K. G. writes: Can the toning bath mentioned in the enclosed slip (see below) be used more than once, or is it necessary to prepare an entirely new bath for every batch of prints?

TONING SOLUTION.

Solution A (gold chloride).	1 ounce.
Solution D (sodium bicarbonate)	1 dram.
Water	6 ounces.

Add Solution B till the bath shows an alkaline reaction—that is, till it turns red litmus paper blue.

Warm the toning bath until it feels slightly tepid. Immerse the prints in the toning bath until they assume a rich, warm color, as desired, or until they become of a bluish tone. Then wash them in one change of water.

A.—When the above toning bath works slowly, by following the directions, it is only necessary to add another ounce of gold chloride solution, and proceed as before. The bath will keep indefinitely, provided its volume is kept up with water, also that it turns red litmus blue, and *remains clear and colorless*.

Views Caught with the Drop Shutter.

THE BAUSCH & LOMB OPTICAL CO. write us: The Prize Contest inaugurated by us closed November 1st. The negatives are coming in fast from the different societies and the results are very gratifying. It is agreeable to notice the variety of instantaneous subjects selected and the manner in which they are used to bring about artistic effects.

In the near future we hope to send you a complete list of the competing societies, the names of the winners and the subject that was awarded the prize. As soon as all the negatives are received, the judges appointed by us will decide upon the cash prizes according to the conditions of the contest.

J. A. French, Keene, N. H.—A Retrospective View—Thirty Years Behind the Camera, and Twenty-fifth in Same Studio.

Thirty years ago the following announcement appeared in the columns of the *Cheshire Republican* and *New Hampshire Sentinel:*

"Ambrotype Rooms.

"The subscribers respectfully inform the citizens of Keene and vicinity, that they will open their Daguerrean Gallery, in Richards' Building, on Friday, November 1st.

J. A. French.
D. A. Sawyer."

October 2, 1861.

They then invited their friends to the pleasant rooms in the above named block, where for four years they labored to merit the patronage so generally bestowed upon them. The destruction of the building by fire deprived them of their rooms; destroyed all their instruments, stock and fixtures and compelled them to occupy a more humble location. For the next 15 months they were located in a photographic car, on Central Square, endeavoring to satisfy their patrons the best they might in their contracted quarters. In February, 1867, they first occupied their present suite of rooms in Bridgman's Building, which has been arranged especially for them, and which has proved very convenient for their business, and they trust, pleasant and attractive to their customers.

In 1871 Mr. French purchased the interest of his partner, and has since carried on the portrait and view business, with assistants of ability and experience, making many improvements as opportunity presented.

Besides the fine production of photo portraits, Mr. French has published large numbers of landscape views in Cheshire County and other localities, and the productions that bear his imprint can be found in foreign countries and in many households in our own land. He has made landscapes and architectural negatives to illustrate several of the towns' histories of Cheshire County.

He has accompanied two Raymond & Whitcomb excursion parties as excursion photographer, one to the White Mountains, the other to Niagara Falls. In 1885 he was chosen excursion photographer to accompany the G. A. R. excursionists from Boston, Mass., to Winchester, Va. In 1890 he published a very neat and attractive "Souvenir of Keene," in book form, which has had a very good sale, and is worthy of it. Since 1879 O. P. Baston, an artist of twenty years' experience and much ability, has been in the employ of Mr. French.

The gallery is fitted up with all modern improvements and conveniences, and new and quick processes are used. He manufactures stereopticon transparencies, illustrates lectures upon any subject when desired, by the oxy-hydrogen light.

Few men are now in trade upon Central Square who were thus engaged when Messrs. French & Sawyer began business in 1861 in Richards' Building. Mr. French is now making fine pictures of the children and grandchildren of many of his former patrons, as well as those of the present generation.

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ANTHONY'S

Photographic Bulletin.

EDITORS:

PROF. CHARLES F. CHANDLER, PH.D., LL.D.
PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

VOL. XXII. DECEMBER 26, 1891. No. 24.

ALLOTROPIC SILVER.

SOME time ago we called attention to the interesting researches of Mr. M. Carey Lea upon the forms of metallic silver obtained by him in a series of reduction processes, and which exhibited colors of the most brilliant character, totally unlike our ordinary ideas of the color of this well known metal. These new forms of silver he has called allotropic, and the principal methods of producing them are as follows:

1. By reduction of silver citrate or tartrate with ferrous citrate or tartrate.
2. By the action of dextrine and alkaline hydroxide on silver nitrate or oxide.
3. By the action of tannin and alkaline carbonate on silver nitrate or carbonate.

The action in each case is interrupted by the addition of an acid like hydrochloric, and the brown or purple precipitate washed with water and treated with cold nitric acid, which gives an insoluble residue of a very rich color.

This series of experiments has attracted the attention of many chemists as well as photographers on account of their novelty and as tending to the solution of the problem of photography in colors. M. Berthelot recently exhibited some of Mr. Carey Lea's specimens at the Academy of Sciences at Paris, and called the attention of the French savants to the analogy between them and the various forms of carbon, phosphorus, iron and steel; all of which may be considered as allotropic forms of these elements.

In his lectures on "Photographic Chemistry," Professor Meldola has expressed some doubts as to the character of these new forms of silver, and in a recent number of the *Chemical News* Mr. Carey Lea defends the position he has taken on this most interesting question in the following words:

"In a recently published lecture Mr. Meldola seems to call in question the

existence of allotropic silver. This opinion does not appear, however, to be based on any adequate study of the subject, but to be somewhat conjectural in its nature. No experimental support of any sort is given, and the only argument offered (if such it can be called) is that this altered form of silver is analogous to that of metals whose properties have been greatly changed by being *alloyed* with small quantities of other metals. Does, then, Mr. Meldola suppose that a silver alloy can be formed by precipitating silver in the presence of another metal from an aqueous solution, or that one can argue from alloys, which are solutions, to molecular compounds or lakes? Moreover, he has overlooked the fact that allotropic silver can be obtained in the absence of any metal with which silver is capable of combining, as in the case of its formation by the action of soda and dextrine. Silver cannot be alloyed with sodium.

"Mr. Meldola cites Prange as having shown that allotropic silver obtained with the aid of ferrous citrate contains traces of iron, a fact which was published by me several years earlier, with an analytical determination of the amount of iron found. Mr. Prange repeated and confirmed this fact of the presence of iron (in this particular case), and my other observations generally, and was fully convinced of the existence of both soluble and insoluble allotropic silver. Mr. Meldola's quotation of Mr. Prange would not convey this impression to the reader.

"Of the many forms of allotropic silver, two of the best marked are the blue and yellow.

"Blue allotropic silver is formed in many reactions with the aid of many wholly different reagents. To suppose that each of these many substances is capable of uniting in minute quantity with silver to produce in all cases an identical result, the same product with identical color and properties, would be an absurdity.

"Gold-colored allotropic silver in thin films is converted by the slightest pressure to normal silver. A glass rod drawn over it with a gentle pressure leaves a gray line behind it of ordinary silver. If the film is then plunged into a solution of potassium ferricyanide, it becomes red or blue, whilst the lines traced show by their different reaction that they consist of ordinary silver. Heat, electricity and contact with strong acids produce a similar change to ordinary gray silver.

"These reactions afford the clearest proof that the silver is in an allotropic form. To account for them on suppositions like Mr. Meldola's would involve an exceedingly forced interpretation, such as no one who carefully repeated my work could possibly entertain."

From the above it seems difficult to conceive of any other explanation of the beautifully colored varieties of silver that Mr. Carey Lea has made us acquainted with, except that of allotropic forms of that metal. Our knowledge of the red and yellow forms of phosphorus, the several crystalline forms of sulphur and carbon, leads us to believe that it is more than probable that these colored forms of metallic silver are of the same character, arrangements of the atoms in the molecule differing from the ordinary arrangement in the metal.

We hope that Mr. Carey Lea will continue his very interesting work on this subject, and lead us to a better understanding of the nature of the latent photographic image, which, up to the present time, is an unsolved problem in photography.

EDITORIAL NOTES.

In addition to the list of new contributors to the Bulletin for 1892, given in the statement of our publishers in the last issue, we would remind our readers that we shall still have the services of our old friends who have helped us to make the Bulletin what it is to-day. Amongst many others, we would mention the names of P. C. Duchochois, too well known to need any commendation; and C. E. Von Sothen, of United States Engineer School, Willett's Point, N. Y., who has promised us a series of interesting and instructive papers.

The following letter from Mr. Peabody, Chief of the Department of Liberal Arts, to the editor of *The Eye*, settles the matter about a separate department for the exhibion of photography at the World's Columbian Exhibition. We will not have a building devoted to photography:

Chicago, November 27, 1891.

Mr. C. Gentile,

Dear Sir: The communication from the committee of the American Photographic Conference, of which you are chairman, asking for a special building for the display of photographic art, was referred by the Director-General to the Committee on Buildings and Grounds. In the answer of the committee, which is before me, I find it stated "that it is very doubtful whether room can be secured for such a building, and if secured, whether the financial plans of the Exposition Company will justify a separate building at the expense of the corporation for the useful art of photography, which, in the classification, has been provided for in the Department of Liberal Arts."

It appears to me that this must be considered as conclusive upon the subject of a separate building for this purpose.

Yours truly,

Selim H. Peabody,
Chief Department Liberal Arts.

The Toledo Camera Club has arranged for a prize contest, open to all members, to close on the 1st of March next. A 5 x 7 Blair camera, fitted with an Ajax lens, and valued at $25, constitutes the prize for Class A, which includes 4 x 5 prints and under, and a 5 x 8 Bausch & Lomb Rapid Universal lens, valued at $34, will be awarded in Class B, which is for 5 x 7 prints and over that size. Each contestant must have exposed and developed his negatives, and may submit as many as five subjects. A novel feature of the contest is, that every subject submitted in competition must be strictly a winter scene. The committee on awards will consist of three, and all prints submitted are to become the property of the Club.

At a meeting of the Case School Camera Club, December 4th, the following officers were elected: President, H. J. Lueke; Vice-President, A. G. Bishop; Treasurer, P. W. Cobb; Secretary, R. B. Smith; Corresponding Secretary, C. L. Kennicott. At the meeting held December 18th, Mr. M. B. Punnett was to give a demonstration of the "reversal of the image" by tetrathiocarbimide ammonium bromide, as discovered by Colonel Waterhouse. No report has yet been received.

Mr. H. Millikin, of Monticello, N. Y., writes that he has a complete file of the Bulletin since 1871, with the exception of one year, which he will part with if desired. We note the fact here, as there is often a call for back numbers which the publishers are not able to fill.

We regret our inability to attend the Lantern Slide Exhibition given by the Agassiz Association on the 14th inst., to which we were very kindly invited; we doubt not that it was most enjoyable.

It is said that the new portrait of Miss Ada Rehan, which adorns the foyer of Daly's Theatre, is the largest photograph in the world, measuring almost 7 feet by 3½. It depicts the actress in her interpretation of Rosalind, and is spoken of in terms of the highest commendation by all who have seen it. This enormous picture was made by Walery, of London.

The third annual exhibition of prints and lantern slides by the Tech Camera Club, of the Worcester Polytechnic, was held on the 5th inst., and was a complete success from every standpoint. Prizes were awarded in fifteen classes. The officers of the club are: President, Edward H. Keith, '94; Vice-President, Aldus C. Higgins, '93; Secretary, Edward W. Vaill, Jr.; Treasurer, Howard A. Coombs, '93.

The California Camera Club are again at the front with an offer to assist another worthy social charity, this time the congress of dolls. They will furnish a slide exhibition for the purpose of raising funds therefor. The nineteenth illustrated lecture was given on the 10th by Chas. H. Steele, A.M., M.D., on Northern Italy.

In addition to the valuable work that has been done and is constantly being accomplished by photography in the detection of crime and criminals, a scientist, Dr. Jeserich, has discovered by its aid, in conjunction with the microscope, that the human hairs possess a very marked individuality, and has applied his discovery to such good purpose as to have proven conclusively in one case that a man who had been arrested and imprisoned for supposed murder was innocent. This system will doubtless be of much value as a means of identification in many fields of work.

The Cranford Camera Club gave a very interesting lantern slide exhibition on the 7th, which was largely attended and greatly enjoyed. We should much like to have been present. The club is not large in numbers, but in enthusiasm it may be catalogued with the best.

A formula which is said to be of much value to photo-lithographers for causing the ink to leave the transfer paper freely, is as follows:

Bichromate of potash	50	parts.
Water	1,000	"
Sulphate of manganese	5	"

A very creditable exhibition of prints has just been made by the Plainfield Camera Club, the fourth annual one that the club has given. Prizes were

awarded in eight classes and many exceedingly artistic prints shown in all. The Committee on Awards was made up of Messrs. Guillermo Thorn, William Montfort and Franklin Smith.

A NEW camera club has been formed in St. Louis called the Sunny Side, with the following list of officers for the first year: President, Judge B. W. Blumenthal; Vice-President, S. C. Martin, Jr.; Secretary, Ludlow Maury; Treasurer, Prof. William A. Brichner.

AT a recent lantern exhibition in England, a shocking accident resulting in loss of life and limb occurred, owing to the explosion of the bag containing the gas. We believe that such accidents are less liable to happen in this country than abroad, for the reason that the dangers of the gas bag for the storage of such gas, are very generally understood and appreciated here, and cylinders are now easily to be obtained by any one. The liability of the bag to be exploded is much greater than the cylinder, and the effects much more apt to be disastrous in case an explosion does occur; as in the case of the bag, the force is exerted equally in all directions, whereas in the case of the cylinder, there is seldom more damage done than the blowing out of the gauge or plug, as happened in London only a short time since. In this instance, too, the accident was wholly due to carelessness of the operator, who opened the valve suddenly and allowed the full pressure of the stored gas to accumulate in the pressure gauge at once. The result was the destruction of the gauge and a startling experience for both audience and operator, but no injury to any one. It should be borne in mind by all who are using cylinders, that the gas should be released gently and evenly at first, if serious trouble would be averted.

THE Burlington (Iowa) Camera and Sketch Club have entered upon the second year of their existence with good promise. The club is made up of live and enthusiastic members, and is well established on a solid basis. Its officers for the coming year are: President, E. L. Parsons; Vice-President, G. H. Washburn; Secretary and Treasurer, G. H. Krieschbaum.

IT is not often our duty to record the disbandment of a photographic club, and particularly one which has attained such a prominence as the Pacific Coast Amateur Photographic Association. This was one of the pioneer clubs, and was made up of hard workers and enthusiastic camerists. Their club was governed by very strict rules, which had a tendency to keep many new men out, and through lack of healthy accretion and the loss of several of the best workers, the affairs of the association took such shape that it was thought best to terminate its existence while it was still in good standing, thus leaving a good record behind it, than to run the risk of its falling into decay.

WE learn with regret that Mr. Sam. C. Partridge, so well and favorably known on the Pacific coast, is lying dangerously sick at his home in Oakland.

THE new developing agent, Rodinal, which is in reality only a highly concentrated solution of para-amidophenol, is proving all and somewhat more than

was expected of it. Its value as a developer for bromide prints, already alluded to in the BULLETIN, page 683, has not been overestimated, and it seems from further experience to be equally adapted to the development of plates, working with much the same rapidity as eikonogen, and requiring only an extremely dilute solution to produce a negative of full detail and beautiful blue-black color. As in the case of all developers, the greater the dilution, the slower the action ; but it differs from many in the fact that development with a very weak solution produces a strong, vigorous negative if carried far enough. It works with an entire absence of fog and produces from a greatly undertimed negative results which are hardly credible. Development must be carried to a point of very considerable density or a noticeable reduction occurs in the fixing bath. Potassium bromide may be added to it to the extent of 5 parts to 100 of a solution 1:10, without clouding the lights or injuring the tone of the prints in any way when working in bromide. We look for further development of this agent with interest.

PRINTING BY DEVELOPMENT.

BY P. C. DUCHOCHOIS.

WE thought that the old process of impression by development on salted or bromo-iodized paper was for a long time altogether abandoned, it having been superseded by those in which the paper is coated with a gelatino-silver chloride or bromide emulsion. It appears, however, for reasons which we do not know at present, that the process in question is revived, as are many others, and employed in New York for enlarging by the electric light.

Having been told that some operators were troubled with certain failures which, owing to the simplicity of the process, we think to be due to the formulas, and, perhaps also, to the modus operandi now too succinctly explained in text books, we have written this paper for the BULLETIN in order to guide the reader who has to work the old process.

To obtain clear and brilliant prints by development it is important to prevent the sinking of the image into the paper by a sizing which keeps the sensitive preparation on the surface.

The size most suitable for the process we are going first to describe is starch from the Brazilian tapioca or arrow-root. We used the latter and compounded it with albumen, which can, however, be left out, its object being to render the size still less spongy by its coagulation when acted on by silver nitrate.

Rub up in a porcelain mortar 8 or 10 parts of genuine arrow-root with a little water, leaving no lumps unbroken, and when the paste is homogeneous diffuse it in 480 parts of water. Then, having placed the mixture in an evaporating dish, heat it to boiling while stirring with a spatula. Let then the whole cool down, and, having removed the scum formed on the surface of the paste, intimately incorporate this solution :

Clear albumen	5
Acetic acid No. 8, pure	1
Water	30 *

To apply the size—previously strained through a sieve—place, felt side upward, a certain number, say one dozen, sheets of paper on a smooth board

* The formulas are given by parts : grains or grams for the solids ; minims or cubic centimeters for the liquids.

and fasten them by the four corners with drawing pins, then with a damp large sponge take up a little of the size, and spread it on the length, then the breadth of the uppermost sheet, as equally as possible, removing the excess, if necessary, with another sponge. This done, remove with a brush, or a second damp sponge, all the striæ and smooth the whole. If the operation is well made the paper will present a fine polished surface. Hang up the paper to dry and proceed in the same manner with the other sheets. The amount of paste above given is sufficient to size about two and one-half dozen whole sheets of paper of the ordinary photographic size.

The sized paper keeps quite well. It can be employed in many other processes, such as the printing out silver process, the platinotype, etc.

For our purpose the photographic process is as follows: Prepare

Sodium iodide	5
Sodium bromide	2
Sodium chloride	2
Lemon juice	20
Water	480

Filter.

On this solution the paper is floated for two minutes, or, if the sheet is large, prepared by brushing. It keeps well. However, in a short time it assumes a slight irregular violet tint from the combination with the starch of a little separated iodine. But this is of no consequence, for it necessarily disappears in the sensitizing, which will convert the iodine into silver iodide.

The silver bath consists of

Silver nitrate	6 to 9
Citric acid	2
Water	480

The softer the negatives the stronger the silver bath, and the weaker it should be when they are harsh, white and black.

Small sheets of paper are sensitized, in the dark room, of course, by floating for twenty-five or thirty seconds, or the silver solution may be spread over with a glass triangle, or a kind of brush made by fastening a double of canton flannel between two glass plates about 1 decimeter (4 inches) wide by 2 decimeters long. However, brushing large sheets over often leaves markings of various kinds, and is not for this reason recommended. As to the glass triangle, Mr. Sandford has devised an improvement which permits one to economically sensitize very large sheets in the most easy and regular manner: "Instead of a solid triangle have a hollow one of a considerably larger diameter than ordinary, and capable of holding more than enough silver solution to sensitize one sheet, however large it may be. Let the base of the triangle, which must be straight and nearly as broad as the paper, be perforated with small holes. Let the apex on one side be sealed and open on the other. Through this opening the solution may be poured in. This should be done over some vessel which will receive the leakage through the small holes when filling the tube. When a sufficiency of the solution is poured in, close the orifice with the thumb to cut off the pressure of the air and then stop any leakage.

"With this distributing instrument it will be obvious how, by pressing and moving the perforated base of the triangle against the sheet of paper laid on a flat surface, and by regulating the supply of liquid with the thumb over the

orifice through which the air is admitted, a most regular and complete sensitizing can be obtained with a minimum of silver solution. There may be, nevertheless, an excess, which should be evenly distributed, and the superfluous quantity drained by holding the paper by two corners and moving gently till the excess has dropped off or been absorbed."

The exposure time should be lengthened until the outlines of the image are faintly visible, when the image is at once developed by the following solution:

Gallic acid	4
Lead acetate	2
Acetic acid, glacial	15
Water	480

This developer is applied as above described for sensitizing, the perforated triangle method being the most convenient for very large prints.

Before fixing or toning, the proofs should be washed in water several times renewed, and lastly immersed for an instant to neutralize the acidity of the paper in water holding in solution a small quantity of sodium bicarbonate.

Fixing bath, sodium thiosulphate, 1:10.

Toning bath, any one of those used in the ordinary albumen printing out process, but stronger.

This process is specially adapted to enlarge by the solar and similar cameras. To print by contact, or keeping, the sensitized paper should be rapidly washed in two changes of water, then sponged, then dried, and if possible kept in a desiccating box.

The washed paper requires the addition to the developer of a small quantity of a 5 per cent. silver nitrate solution.

The proofs by contact can also be developed with:

Pyrogallol	0.25
Citric acid	0.25
Water	480

The process now to be described can be employed both to print by contact or by the enlarging camera. It gives very fine results indeed.

Salting Solution.

Ammonium chloride	10
Ammonium citrate	10
Rice water	480

To which one adds a few drops of a 1:20 aqueous solution of citric acid, just enough to render the solution slightly acid.

Rice water is prepared by boiling in 480 parts of water 50 parts of rice (previously washed) no longer than it is necessary to break the rice open, so as not to thicken too much the water by starch. Instead of rice the water can be charged with a little starch by boiling a small quantity of powdered tapioca.

The paper—Steinbach is very good—is floated for a minute on this solution or imbued with the same in the manner before described when the sheets are large.

To sensitize it the salted paper is floated when dry on the following silver bath for no more than from thirty to forty seconds, then hung up to dry: *

Silver nitrate	20
Water	480

Citric acid, 1:20, quantity sufficient to turn red the blue litmus paper.

* For enlarging, the paper can be exposed while wet. But then it should be developed immediately after exposure. Large sheets are sensitized with the triangle.

As usual, the exposure time is subject to the intensity of the light. When printing by contact from twenty-five to forty seconds exposure suffices by good diffused light, and necessarily a good deal less time, say from five to six seconds, by direct sunlight. Generally the exposure is correct when the image is visible and of a lilac tint. It is more conveniently and clearly developed by the lead gallic developer, thus :

Gallic acid	2
Lead acetate	1
Acetic acid, glacial	2½
Water, tepid	480

This developer acts slowly—and that is an advantage—taking about four minutes to bring out all the details with sufficient intensity. The image must not be over-developed, but just as it should be when finished, for it loses nothing or very little by the subsequent operations.

The following developing solution is also employed. It acts with greater energy, but more easily produces marking. The tone, however, tends more to the black :

Pyrogallol	0.5
Citric acid	0.5
Water	480

After the development the print should be well washed and afterward fixed in a 25 per cent. solution of sodium thiosulphate (hyposulphite), in which it should remain during five or six minutes, when it is washed in water renewed three or four times, then toned, and finally thoroughly washed.

The toning solution is prepared according to the formula following and in the manner explained :

Sodium thiosulphate	5
Ammonium chloride	15
Water	480

When dissolved add little by little and agitating a filtered solution of

Gold terchloride	1
Chalk in powder	1
Water	480

The proofs can also be toned before fixing. Any one of the toning baths used in the printing out process can be employed.

We have used with good results Clemon's positive arrow-root paper, and also the albumen paper of commerce. Both are salted. The modification to be made in the formula of the salting solution for albumen paper in order to coagulate the albumen is obvious.

PHOTOGRAPHY IN THE COLORS OF NATURE.

BY F. E. IVES.

Dr. H. W. Vogel, in an article on "Photography in Natural Colors," in Anthony's Photographic Bulletin, November 28, 1891, makes the following statements :

1. "The writer, in 1885, published an improved heliochromic process. Five years later Ives introduced an analogous principle, whereby his ideas were at first directed to lantern representations only." "Later on, Mr. Ives adopted the same ideas * * a little too late.

2. "He has published a very interesting article in the January number of the *Franklin Institute,* but which contains a good many errors.

3. "He operates these with the old color theory of Young-Helmholtz and the so-called complementary colors, all ideas of the old school.

4. "Mr. Ives has absolutely misunderstood my publication.

5. "It is sufficient to point out the fact, as proven by me, that the designation 'complementary colors' is very unsettled, and that even one and the same color can have different complementary colors.

6. "Nothing is clearer than my principle. The optical sensitizer or a spectroscopically analogous color is the print color."

A very few facts and references will, I think, sufficiently prove that such of Dr. Vogel's assertions as may seem to throw discredit on the claims which I made in the article referred to (*Journal of the Franklin Institute,* January, 1891), are either false or misleading; that he has committed important errors himself while charging me with errors which are not proven; and that his "principle" is worthless.

1. The process which I have patented was published in Anthony's BULLETIN, December 8, 1888, p. 716, *three* instead of *five* years after Dr. Vogel published his alleged "new principle." Reference to the publication itself will show that my ideas were *not* "directed to lantern representations only." I said, among other things to the same effect, "when pigments are used instead of colored lights, owing to the fact that their combination adds shade to shade instead of light to light, the complementary colors (something like prussian blue, magenta and yellow) are required." And finally, I deny, and have proved clearly enough in the publication to which Dr. Vogel now refers, that my process is *not* based on an "analogous principle" to his own in any such sense as he would have it appear. Here are three apparently inexcusable "errors" to charge against Dr. Vogel.

3. The expressions "old color theory" and "ideas of the old school," are apparently intended to create an impression that the theory upon which my process is based has been superseded by another. The fact is, as I have shown repeatedly, that all modern textbooks on color, by such eminent authorities as Von Bezold, Rood, Church and others, and the most eminent physicists, such as Rayleigh, not only indorse that theory, but also consider it proved.

4. I stated what I conceived to be the fundamental principle involved, independently of the means taken to carry it out, which, however important they might be in practice, are of secondary importance from a theoretical point of view. A more detailed description of Dr. Vogel's process, to which he himself did not object, I incorporated in an earlier publication. [*Journal of the Franklin Institute,* February, 1889.] From what he now says, it appears that he claims even less than I gave him credit for, confining himself to a plan of procedure which I shall show to be positively wrong. Dr. Vogel himself has never had the fairness to state my principle in the publications by which he has sought to discredit my claims, but seeks to make it appear, by inference, to be something different than it is. The extreme unfairness of this course will be evident when it is considered that I claim that true success in composite heliochromy is impossible except by carrying out this principle, before unknown.

5. I hold that the sum of the light which a dye absorbs is a perfect complementary color to that dye, and that in saying that Dr. Vogel's principle calls for

print colors complementary to the light absorbed by his "optical sensitizers," I state the exact truth more concisely and better than he states it himself.

6. I have shown that a negative of the spectrum made by exposing a cyanine stained gelatine-bromide plate through a suitable orange-yellow light filter, will show a distribution of intensity corresponding closely to the measured effect of the spectrum rays upon the fundamental red sensation, and that the print color for this negative must, in accordance with true color theory, absorb powerfully the red, orange and yellow rays, and transmit the green and blue violet. Acid prussian blue does this. Dr. Vogel's principle would call for cyanine as the print color for this negative; cyanine absorbs green, which it should not for this purpose absorb at all, about as much as red, which it should absorb powerfully. If substituted for prussian blue in my process the shadows of my heliochromes would be a deep red instead of black, grass green would reproduce as red, and spectrum green as reddish brown or gray. This example alone is sufficient to demonstrate that I have not adopted these [Dr. Vogel's] ideas, and that his principle is worthless. Add to this the facts that I reproduce all colors with three dyes, with one sensitive plate, with one exposure, and from one point of view, while Dr. Vogel's principle appears to call for any number of separate negatives, not less than five (*vide* Bothamley), and the weakness of his claims will be sufficiently apparent.

PHILADELPHIA, December 1, 1891.

[*From Prometheus.*]

A NEW DEPARTURE.

SCIENTISTS and amateurs have tried for some time to solve the problem of making direct enlarged views of distant objects, the same as they may appear through a hand telescope. The ordinary photographic lens will easily give us an idea of the size of distant objects depicted by it, if we consider that the size of the original is in proportion to the picture size, its distance from the camera compared with the focal length of the lens. For instance: A person of 2 m. height, walking at a distance of 100 m. from the camera, and the lens having 0.2 m. focal length, then his picture is only 4 mm. high, and will therefore give hardly the outlines of the figure without the least details. Or if we take a large camera of $\frac{3}{4}$ m. focal length of lens, a view of a fortress of 10 m. height and 150 m. length at a distance of 10 km., our picture would be only 0.75 mm. high and 11 mm. long, and would represent therefore nothing but a horizontal line without any detail. The only available means we have possessed so far to enlarge the dimensions of the picture were to approach the object and measure the focal distance of the lens. Where the former was impossible the latter would be of little avail, because of the difficulty of production, price and transportation of lenses of several meters focal length being a serious obstruction to their practical application.

An instrument of really practical use should combine the following conditions: Small dimensions and focal length, unrestricted selection of the size of the focal picture without change of position and lenses, and as much light power as possible. All these advantages are now united in a new, very simple objective, for which Dr. Adolf Miethe has made patent application a few weeks ago. On the outside it differs only from an ordinary aplanat by a little more

length, and by an arrangement which admits of changing the distance of both lenses within certain limits. The optical part consists of a convex lens of pretty long focal length and a concave lens of short focus. Their distance from each other equals about the difference of both focal lengths. The result, for optical reasons, is that such a system will depict reversed pictures of objects which are on the other side of the convex lens at great distance. The size of these pictures varies on the one hand with the distance of both lenses, and increases with their approach; on the other hand it is dependent upon the condition of the focal lengths of both lenses. The more the difference in their focal lengths, the larger will be the picture under otherwise equal circumstances. Supposing that the focal lengths were in proportion of 25 to 1, this system would depict pictures which, at each focus, would be twenty-five times as large as that made by an ordinary lens at the same distance.

Certain optical requirements with regard to the quality of the picture render, of course, a definite form of lenses necessary, which, single or together, are to be achromatized chemically by a combination of flint and crown glass. But there are no serious obstructions in the execution of this, and the problem to construct such a system for the above purpose according to all rules of optical calculation is simpler than the calculation of an ordinary photographic lens system, where much larger picture angles are to be regarded. The whole apparatus resembles in principle a Galileio telescope, only that in this case it finds application for the formation of a real picture and the use of proportionately large visual fields. Every one who is in the possession of an opera glass and a camera can form an idea about the action of the system by mounting one tube of the opera-glass to the front board of the camera, giving lens and bellows as much draw as possible, and directing the instrument upon a distant well illuminated object. By getting the opera-glass into proper focus a picture is easily obtained which is very large, and appears, at least in the middle, pretty sharp; the objects near by have marked color edges, a consequence of the defective and for this purpose unsuitable construction of the telescope.

The field in which the new objective will find application is presumably a large one. Wherever the object of which a view is to be taken cannot be approached it will be used. During war, in front of fortifications, at scientific expeditions, for topographical views and surveying purposes, photo-grammetrical works and detail studies of buildings and monuments, etc. Equipped with the camera, the eagle high up in the air and the far-off torpedo boat can be taken with all distinctness. Its application for life-size portraits in confined places is beyond a question, and lenses of 2 to 3 m. focal length will be needed no longer. But we are afraid the new instrument will also disturb the peaceful citizen in his solitude, and numerous shots will be fired from amateur cameras at long range on subjects unaware of the presence of these disciples of the black art.

[*From Photographisches Wochenblatt.*]

PORTRAITS AT HOME.

BY DR. A. MIETHE.

The task of taking portraits in a room is just as difficult as it is gratifying. The amateur who has no gallery at his disposal is obliged to resort to his dwelling-room, if he does not want to work out-doors and is bent upon making

portraits. But the professional photographer just as well could accept many orders that would pay him, and could produce many handsome pictures, if he would acquire a little practice in taking portraits in a room. In Paris there are a number of photographers who take portraits of customers in their reception-rooms. The pictures of Nadar are well known.

The magnesium flash-light has made it possible to make portraits in every room, even the darkest, and at night. But not every photographer has interested himself sufficiently about it, and it is also not applicable to rooms where the illuminating apparatus cannot be properly placed, and the unavoidable smoke is an obstruction.

I would like, therefore, as the result of a number of experiments in different rooms and under various light conditions, to submit my experience about the possibility and execution of portraits in a room by daylight. Regarding the apparatus, there is not much to be said. Almost every solid camera is suitable, if provided with the necessary tripod. Many times I have even placed the apparatus upon a table. The selection of the lens, however, is important. With an aplanat of only moderate rapidity nothing can be accomplished. On the one hand it requires a very long time of exposure—even under favorable circumstances from ten to fifteen seconds—and on the other hand hard pictures are mostly the result, perhaps in consequence of a slight under-exposure. I have never succeeded in taking a good picture with such a lens, but a portrait objective of great rapidity is particularly suitable. The professional photographer possesses generally such instruments—quick workers—from former times, which, hardly of any use in the gallery, are in the room invaluable. The amateur can acquire such instruments very cheaply, of course in different qualities, so that he will do well to consult an expert. A lens of $2\frac{1}{2}$ to 3 inches diameter and from $7\frac{1}{2}$ to 14 inches focal distance is sufficient, as pictures of larger size than cabinet are generally not made. Larger instruments are not well applicable, requiring a distance which is not well attainable in a room, particularly because it is almost impossible, at the expense of illumination, to make use of the full length of the room between objective and apparatus. For the same reason the question, bust, one-half or two-thirds size picture or full size figure, is thereby decided. With these small instruments a sharp cabinet size can only be obtained by applying a diaphragm; a full figure is still more difficult. There are also difficulties in the illumination. It is almost always impossible to light a full figure uniformly without complicated arrangements. The lower parts do not receive sufficient light. Being thus restricted to cabinet pictures, the necessary consequence is an artificial background, because in most cases we will not be able to find a surface sufficiently even for the production of a good picture. The small depth and the close proximity of the lens causes all objects outside of the focus to be almost unrecognizable, the small high-lights rise to gigantic shapeless masses and the dark surfaces are subdued by the bright ones. As a suitable background a piece of canvas serves best, about a square meter in size, and stretched upon a small frame. By a suitable distance the brightness can be greatly varied. A good illumination is also obtained, if the portrait is set off dark on the shady side and bright from the light side of the ground, or reversed.

The principal difficulty in all interior views is now in the illumination and position suited to conditions. Not in every room any desired light can be

obtained, and this must be governed by circumstances. Generally three different cases can be distinguished, which may be found in an interior :

1. Room with one window.
2. Room with more windows on one side.
3. Corner rooms with two windows at different sides.

It may also be remarked that two requisites are required to obtain good results. These are a large sheet of white cardboard or white drawing paper mounted on pasteboard ($\frac{3}{4}$ square m.), the reflecting screen, and secondly, a smaller sheet of pasteboard with dark paper ($\frac{1}{2}$ square m.), the protecting screen. These fixed on stands are fully sufficient.

1. Room with one window. In rooms of this description several good illumination effects can be obtained. One mode is the following : The person is posed at about 2 m. distance from the window with the face toward the same, so that a pure front light is had, and the lower part of the window is covered by a dark curtain or shade. The apparatus is placed sideways, so that a profile picture is obtained ; behind the person, somewhat toward the apparatus, is the reflecting screen, so that the one-half of the face directed toward the apparatus is half illuminated from behind. The protecting screen stands so that it covers the window for the apparatus, to avoid any disturbing reflections reaching the lens, which would produce a flat picture. The background may be kept dark or light according to its inclination toward the window. To prevent dazzling of the eyes of the sitter he should look toward the dark curtain. A light dress is also desirable to prevent the deep shadows in the back. The time of exposure with a somewhat good light for a well-lit full face portrait is at the most from one to one and one-half seconds. Half face pictures are made with less success in rooms with one window. One may proceed as follows : The apparatus stands to the right or left near to the window, with the ground glass toward the light. The person sits in the rear of the room half toward the light, leaving the apparatus on the right side in front. The background, to avoid dark shadows, must be placed at a pretty good distance from the sitter. Reflecting and protecting screens are not applied, the latter being unnecessary and the former having very little effect. When the ceiling is light the illumination is mostly satisfactory, but the pictures are easily monotonous and flat, while along the nose, in the corner of the eye and under the chin deep shadows are unavoidable. For pictures of old persons the result is satisfactory. Time of exposure, according to circumstances, from two to eight seconds.

2. Rooms with two to three windows on one side. In this case, particularly because these rooms are generally larger, there are many different effects possible. It remains a principal thing, that the lower part of each window is covered, and that the protecting screen is judiciously applied, so that no direct light touches the lens, even not from the side.

Profile pictures can be made as under : (1) A very fine illumination is also obtained if the sitter is placed with the back toward the light and the reflector is placed close in front of the face somewhat toward the camera, to light up brightly the side of the face directed toward the lens. This pose can be varied by placing the camera in such a position that profile pictures are not obtained, but directing it a little toward the window, whereby the protecting screen is, of course, carefully applied. Very handsome Rembrandt effects can be obtained if this arrangement is properly made use of. How to make profile pictures in such

rooms, with at least two windows, it is not necessary to further explain. There are many ways, by the partial closing of the curtains of the one window, which can easily be found out by following the previously given directions. The eye must be pretty well educated to judge about the different effects of illumination; particular attention should be paid to the dark line, which forms easily if the reflecting screen is injudiciously handled. This dark line, running from the forehead to the chin and disgracing the picture, has its origin in a two-sided illumination without front light; the reflecting screen should never throw light upon the subject at more than one angle.

3. In corner rooms it is very easy to effect good results. The arrangement that gave good results in our hands was the following:

To the left of the sitter in front was a large window, at about 2½ m. distance from the subject, therefore to the left of the camera. A second window was in the rear wall, close to the background, on the right from the person. Its effect is to give illumination of the right bright side of the portrait. The windows were covered below, so that it gave a little more upper light. This was too much the case, the light blonde hair of the model acting too light and chalky. This last window was visible on the ground glass, therefore to the left from the model. The protecting screen was now pushed so far between camera and model that its outline covered exactly the window for the lens. One can easily recognize how by gradual covering of the first window and placing the reflecting screen close behind the protecting screen, the illumination can be so changed that a complete Rembrandt effect is obtained. I believe that in such a corner room just as fine effects can be obtained as in a regular gallery, and even the amateur, if attentive, will be able to produce a good picture. At all events it will be more useful to art than if he produced dozens of portraits with a flat light in some garden or yard, to the discredit of photography.

WITHOUT HIS CAMERA.

BY ADELAIDE SKEEL.

THAT would seem to be a somewhat unusual state of mental vacauity in which one could envy another the passion of unhappiness, yet, on a certain August afternoon, Pollard Keene, cotton broker and amateur photographer, sitting alone in his dory off Butcher's Island, felt a distinct pang of jealousy when the excited voices of an unseen man and woman broke in upon his calm revery concerning the actinic values of the blues and greens of the distant Beverly shore line. He had been rowing for an hour about the rocks of this recently purchased ten-acre continent, charitable Boston's vacation home for children and working girls, and had, now, put into a sheltered cove to rest. He was in no hurry to return, as he had before him the endless vista of a summer evening in which "no bliss drew nigh to him that he might run to greet." He was a club-man, attached to nobody and nothing save his dog, his business, his dory and his camera, and was, therefore, at liberty to dally as long as he found the sunset on the still sea to his mind. Pollard Keene was a free lance if ever the fates permit one in this mutually responsible world; a big, compact, sandy haired, good looking fellow between thirty and forty, distinguished for nothing uncommon save the fetching attractions of his rare smile, which repeated itself in his gray-green eyes in a manner calculated to set every woman's heart a-going, be she

five or fifty. He made every woman appear her wittiest, prettiest and best, so I need not say he was everywhere a favorite. He was born with this smile, people said, and it was valued at ten thousand a year by those who could not otherwise account for his social success on his known small capital; but, alas! he had to cash it in kind, not gold. The world rated him a failure, chiefly because he made no secret of his unfulfilled aspirations; and it was quite the fashion to abuse committees who gave photographic prizes to others, or to feel sorry when business forced him to forego his summer vacations, or to express unusual anxiety when grip made him one of its many victims, when, were the whole truth known, Fortune treated him quite as fairly as she treats the rest of us. Pollard did not overestimate himself, and felt sure of nothing except the one fact already mentioned, viz., he knew people liked him, and deep down in his heart was the undefined purpose of one day making love. Of course, he had not lived all his life in a world of women without trying his 'prentice hand in an amateur fashion; but to do it in dead earnest needed leisure, and that was never to be had when the day was clear for picture-taking or cool and right for rowing. When his holders were filled with plates or the sunlight was dancing on the summer sea, the idea could not be even entertained. Indeed, no such romantic fancies were floating in his head when he put into the cove, and in the easy comfort of a flannel boating shirt threw himself back to consider the probable length of exposure necessary for the Beverly foliage. He was happy about nothing, without knowing it to be nothing, when this sudden glimpse into another's life startled him with a sensation of actual pain. How trifling the difference in a color tone must seem to one whose soul is trembling with the real agonies of life! Why did he stand outside of all things? he wondered. Why was he set aside when something earnest was to be done? What ailed him that no one agonized for him and he agonized for no one? Whose fault was it? Why was he not hungry for other joys than those of sea and skyscapes? He was sure the voice belonged to the He and She of all life and literature before he actually heard and distinguished the words:

"Yes, I love you, Lena, and you love me."

"God pity us both."

"I love you, Lena."

"Don't say it again, James."

The woman's voice was sharp and clear cut, with the slightly falling nasal accent, which adds distinctness to our much criticised American articulation, while the man's had a heavier sound. Pollard wished himself out of the cove with all his heart, for although he could not see the speakers, he was sure they were picnic people making up a lovers' quarrel. This supposition, however, on second thought, seemed hardly tenable, when he remembered that pleasure parties were no longer permitted to land on the island. Here in the big yellow house, with its three-story piazza, ballroom and bowling alley, certain Anglican Sisters of Charity held their gentle sway over a changing flock of vacation children, thus making a success on a philanthropic basis of what had been a business failure from a hotel point of view. To be sure, it was whispered that the cash girls missed their soda water fountains, and that souls mature enough to appreciate dime museums grew as homesick on this gray rock as the guests who the previous summers had paid \$5 a day; yet our eavesdropper in the dory was certain that the owner of the fine clear voice did not belong to the

Negative by A. A. KNOX. Made with PLATYSCOPE "C" LENS.

CUTTER YACHT MAMIE,

OF

BROOKLYN YACHT CLUB.

class whose cheap cloth suits and wind straightened bangs had made his old haunts obnoxious to him this season. The man's tones, too, although not so sweet as the woman's (Pollard made sure the unseen heroine was a fully matured woman, not a callow girl), proved him to be something above the average clambake swain; the mere expressions he used, even in the heat of passion, showed him to be possessed of a certain sophomoric familiarity with modern classics.

"I would rather drown in the sea, Lena," he cried, "than to leave you sitting here on this rock like Lorley."

"Go, James, please do—you have a long walk from here to the float and you know I told you that the 'Brunette' makes but one more trip to-night. She leaves early on Saturdays and you cannot stay over here to-morrow. Go, please go." There was a cold, deliberate hardness in the words which evidently irritated the man, for his response was in a bullying tone. "What if I won't go, or go and take you with me?" he shouted.

"Go, go, go," she answered angrily; "leave me, because I want to be rid of you forever. We hurt each other—go before I have to say it again."

"You hurt yourself, Lena, and I swear"—the rest was lost in the sound of hurried steps and a choking echo of sobs. Forgetting all else, even to stop the laugh at himself for his unusual impulsiveness, Pollard sprang from the boat, and without waiting to make her fast, began a hurried, eager scramble up the steep cliff, filled with the one boyish wish to rescue the fair incognita from the pirate bold and bad; but the path was hard, and whatever the condition of the heart at forty odd, the lungs and limbs are less active than at twenty; hence, when the spot was reached where the speakers had stood, lo! the scene had changed and the actors were gone, and the deliverer staggered up breathless only to find a long bonnet pin to mark the deserted battle field. Stooping down to pick it up, wondering the while if the earth had opened to swallow his Persephone, if perchance the ardent lover had been King Pluto himself, he heard a light footfall on the dry ground, and raising his eyes, saw close by his side a young woman intently searching among the yellow tansy stalks and pink-purple broom for some lost treasure. Absurd as it seemed to associate this well rounded, smooth faced, blooming person, whose fairness was of the easy-going type, with the tragedy queen he had imagined, more ridiculous yet was her despairing anxiety about a pin.

"Pardon me," she said at once, "but I have lost my hat pin, and in this high wind I cannot live a minute without it, as I left the house without veil or parasol;" then, breaking off, as it was returned to her, with Pollard's best bow, again she began, "Oh, thanks so very much." The omission of the "Sir" in the address, the conventional amount of gratitude, albeit a trifle exaggerated under the circumstances, the composure and general nerviness of bearing, reassured the Bostonese concerning the young woman's social position, while the knowledge increased his diffidence. Here was surely no Rider Haggard romance, and, ashamed of his impetuosity in aspiring to make himself the rescuer of one who needed none, he turned to retrace his steps, when a sharp remembrance of his upward climb made him ask: "Pardon, but do you know the rocks about here? Is there no easier way to the water than the way I came? I nearly killed myself scrambling up, to see the view." The laugh in his eyes matched the smile on his lips in its own fetching way, but it brought no answering gleam

in the girl's face as she said, unmoved : "You will find a channel worn by the tides a half dozen steps to the right. It is slippery now with the sea weed, but I think the fishermen use it." With a bow a degree colder than his first salutation he left her, looking back only once to see her moving slowly toward the asylum-like hotel, a large, well developed woman, wrapped in an old-fashioned shawl of an old-fashioned blue color. He remembered, when it was too far out of sight to be seen, that there were some crushed, yellow tansy flowers on the blue shawl, that it's draperies hung loosely about her, that her shade hat, which had so sorely needed the pin, flapped over her serious face, that she was the reverse in every particular of the taut mermaids of to-day's manly style. These picturesque reminiscences, however, were brought to a sudden close when on reaching the cove he found his boat was gone. Looking seaward he saw the yachts coming in to the lovely Marblehead Harbor, and he hailed with delight a glimpse of a familiar sail, yet on second thought hesitated to make his shipwrecked, desert island plight the laughing-stock of his club. A broken tansy stalk at his feet, lying on wet rocks where nature never put it unassisted, suddenly recalled a recent memory of another bit of the same flower, and the conclusion reached by the coincident hurried him up the steep bank to address in stop-thief tones the easily overtaken goddess.

"Somebody has stolen my dory," he said, not waiting to choose his words more civilly. "Do you know if I can get one on the island?"

"I suppose you forgot to tie it and it has drifted away," she answered, "And I am sorry you were so careless, for I do not think the Sisters have an available boat to rent, and the last ferry was an hour ago."

"Then I must stop the night, if the Sisters can put me up?" he asked, tentatively, adding: "I don't mind the inconvenience, but I hate to lose my dory and camera. They were both my own make, and I love them like wife and child, or as I would love wife and child were I blessed with such wealth. Had they been hired or borrowed it would have been easier to bear their loss."

"I should think you would be sorrier to lose another's property than your own," she said, reprovingly, raising a pair of slightly reddened blue eyes to his face as she spoke. Pollard Keene's heart ached for her, angry as he was at himself, herself, her lover, and all else associated with his recent loss; but he made reply, jauntily enough: "Oh no ; one always cares less for a neighbor's property than for one's own; and, besides, I built the dory, and she is a tidy little craft. The camera is a poor thing, but also my own. If I had wife and child I should probably prefer them to my neighbor's."

A second later he regretted this bit of personality as well as the assumed flippancy of his tone, more particularly as his companion received the confidence with the depressing silence it deserved ; but a sudden turn in the sandy road through which they had been plowing as they talked, brought them to the sanitarium, where the novelty of the scene diverted his attention from both himself and the unresponsive woman at his side. Thirty boys and girls of all ages, from crawling babyhood to sweet sixteen, were dancing and shouting about a sister, whose black dress and white head-rigging contrasted drolly enough with the red-coated monkey she was leading by a chain. On closer inspection the animal proved himself to be an agile, irrepressible boy who was permitted this evolution as a reward of good conduct. The prize pupil of this Saturday afternoon certainly did not lack histrionic ability nor gymnastic skill in playing his

part, and Pollard, whose fondness for children often made him late at his office when he found them sailing boats on the Common's smooth lake, now forgot the urgency of his inquiries about the ferry homeward in his delight at the unexpected circus treat. It was not all joy at this Holiday House, however, and he noticed more than one little cripple hobble up to Lena, whose dull, quiet face glowed with tenderness when she felt the clinging touches on her dress. Presently the situation of the shipwrecked stranger was explained to the Sister in charge, and without special cordiality a Saturday night's lodging was offered.

"You cannot do otherwise than acccept, sir," she said authoritatively, when he hesitated, "as the ferry has made her last trip. Early in the season, before the children are sent down, we often have transients, and our charges are $3 a day. Sometimes, indeed, guests remain with us longer, as has been the case with our good friend here." She looked sweetly at Pollard's silent companion, who added no word of apology or courteous entreaty. The situation, nevertheless, had to be accepted philosophically, and this free lance of a club-man was presently shown into an attic bedroom under a shingled roof like Boston's most homeless waif. The somewhat meager supper which followed, eaten in a corner of what was formerly a ballroom of no mean dimensions, was a lonesome affair; but this was no fault of the Sisters, who permitted an early tea to be served him, mistaking his eagerness to see Lena for a hungry desire for food, so that he had filled himself with fish and hot biscuit and left the table before his blue shawled goddess reappeared.

An hour later Pollard disobeyed the mundane clang of a gong braying the vesper hour ; but from his seat on the rocks he could see the whole procession of Sisters in white winged caps, ghastly chin bands and black gowns, making their sedate way over the furze covered path toward the bowling alley chapel, followed by a troup of children; but no blue shawled figure walked with them. Turning his disappointed face again seaward, he finished his cigar sadly, then went to the garret pen to sleep as soundly as any tired child under the roof.

(*To be continued.*)

THE PLATINOTYPE.

To the Editors of Anthony's BULLETIN :

Dear Sirs,—My attention has been called to an article in the *American Journal of Photography,* wherein it is suggested that the term of the platinotype patents had expired. The article is misleading, and, with your permission, I would be glad to state the following for the benefit of any one who may have been misled by the article in question.

The first patent granted in the United States for a process of producing pictures in the metal platinum was granted Willis in 1876. This process, as every one familiar with it knows, was a very complex affair, necessitating the use of silver, gold and hypo before the picture was considered finished. Many beautiful results were obtained by this process, but the working of it was not always attended with success. It was the beginning of "The Platinotype." The patent which followed—1879—was a great advance, but as neither of the three principal salts—ferric oxalate, oxalate of potash, potassic chloro platinite—used in or about the process were in the market, it was a tremendous labor to discover the best method of manufacturing these salts. Moreover, we soon found that none

of the photographic papers in the market could be used for platinotype, and a paper had to be invented for our use.

Our last patent was granted in March, 1890. This patent fully covers the application of a solution of ferric oxalate or its compounds to paper or other surfaces, exposing this prepared paper to the action of light and developing the exposed image to a metallic platinum picture. I have no knowledge of any patented process or processes for prints in platinum other than those of Willis.

The method as published by Pizzighelli was discovered by Willis fully fourteen years ago, and laid aside as being imperfect. A "printing out" process in platinum has long been in the mind of Willis, and hundreds of experiments have been made by him in that direction, but the many difficulties in the way will make it almost impossible to ever get a perfect process of this kind.

Our patents are original. There are no similar patents in any country in the world. It would, therefore, be not difficult to establish our claims.

Respectfully, ALFRED CLEMENTS.

THE FIFTH ANNUAL EXHIBITION

Of The Photographic Society of Philadelphia, The Society of Amateur Photographers of New York, The Boston Camera Club.

The annual exhibition of the above named societies, open to all photographers, professional or amateur, will be held at the Gallery of the Boston Art Club, May 2 to 7, 1892, under the auspices of the Boston Camera Club.

The rules will be substantially the same as for the Fourth Annual Exhibition held in New York last spring.

This preliminary circular is sent now in order that members may have sufficient time in which to prepare their exhibits.

The usual circular giving rules and all other information will be mailed early in January next.

Foreign prints may be sent by mail, unmounted; they will be properly mounted and framed by the Committee of Arrangements.

Please advise the undersigned at an early date as to what we may expect.

Very respectfully,

WILBUR C. BROWN,

Secretary.

BOSTON CAMERA CLUB,

50 Bromfield Street, Boston, Mass., U. S. A.

PHOTOGRAPHIC METHODS OF OBTAINING POLYCHROMATIC IMPRESSIONS.

BY LÉON VIDAL.

(*Continued.*)

One ought, moreover, after carefully studying the original, to retouch each negative, and remove the imperfections which will inevitably appear whatever be the process employed. This retouching can be rapidly done; it diminishes in no way the artistic effect or the accuracy of outline, and it enables more exact color effects to be obtained.

The printer in colors having the above-mentioned four monochromes, sees at once what their defects may be, and a preliminary trial shows him immediately which

portions require to be toned down. The bulk of the work is ready, and it need only be retouched here and there, an operation involving but little labor. (A series of slides illustrative of this were exhibited.)

In order to employ photo-typography for this kind of polychromatic reproduction it is necessary to convert the negatives obtained directly into stippled negatives suitable for typography. This is done by making a positive reproduction through a grained screen. The trials can then be made by means of collotype, and afterwards when the new negatives have been corrected by hand so as to give the proper effects the typographic *clichés* are prepared.

For this process it is advisable not to use the same screen in every case. The various monochromes should be divided up by different series of points or lines, the resulting picture being better than if the same series is used throughout.

Even in the case of composite photochromy it may be necessary to print flat tints. The printer must judge what is required, and must not for a moment think that three negatives, three colors, and three printings are sufficient to produce every effect.

Theory itself we need not consider, but practice indicates clearly that, to make good use of scientific data, it is at any rate necessary to know how to combine them with facts which have, through commercial means, been well established.

This second method of composite photochromy is capable of unlimited variations which cannot be enumerated in a short paper. We must remember this, that by means of color selection with the aid of four different *clichés* one obtains a result which leaves little to be done by hand, and gives excellent polychromatic copies. If a larger number of negatives be necessary, one can prepare two or three more, limiting more closely the colors which are allowed to act on each; but it will rarely be useful to prepare more than four negatives.

In the method described above for color selective effects, we think it advisable that the worker should follow closely the suggestions here given. This method, although very ingenious from a purely theoretical point of view, falls far short of perfection if retouching be not resorted to; but we repeat once more that this additional labor is nothing compared to the work executed in the photographic part of the process.

Let us not be too dogmatic. Let us at present acknowledge our incapability of reproducing colors directly, and let us combine the advantages which indirect methods afford with those of judicious interpretation and retouching. Photography is already far advanced, but cannot yet be trusted to give immediately the monochromes required to produce by their combinations a polychromatic impression exactly similar to the original.

If we grasp thoroughly the points which are necessarily but briefly described above, all lithographers and typographers can obtain excellent results in copying from nature or from works of art. Practice will of course increase the manipulative skill and permit the result to be more easily obtained. It appears, then, strange that there are still so few photographic studios devoted to these kinds of printing. How is it that collotype, which is so simple and so easy a process, and which would be of such great assistance to the lithographer, is still only worked by a few specialists; while, on the contrary, no lithographer ought to be able to dispense with it? We should be glad to make lithographers appreciate that it would be of the greatest help to them in all kinds of photochromy.

That is the object of this paper, and we hope that the fact of its being read before the Photographic Society of Great Britain will cause photography to be more generally applied for the production of polychromatic impressions. Space has not permitted the insertion of technical details, but we are convinced that through the great advances which have been made in orthochromatic photography, and with the aid of the remarkable results which have been published on this subject by many investigators, especially in England, it would be easy for any one who wishes to practice photochromy to do

so successfully, by adopting, according to circumstances, one or other of the methods above described.

It only remains now to say how much we feel the honor of writing a paper for the Photographic Society of Great Britain, and to express our great regret at not being able to read it in person.

[*From the British Journal of Photography.*]

COPYING BOOK ILLUSTRATIONS AND OTHER SIMILAR SUBJECTS BY MEANS OF ARTIFICIAL LIGHT.—V.

BY T. N. ARMSTRONG.

In my previous articles I have referred more particularly to the copying of photographs, lithographs, engravings, or such pictures as are commonly to be met with in books or illustrated publications, also printed matter, such as hymns, maps, etc., and referred to the necessity of following out such a line of treatment in development and after-intensification of the negatives as will yield bold contrast between high lights and clear glass for the blacks on the pictures. No matter what dodging of the negative be resorted to, it is only by doing everything in one's power, and by using suitable plates to obtain such contrasts, that really good results are to be obtained with gelatino-bromide. With collodion, however, it is very different, and whenever a worker is possessed of some experience in collodion work he will understand the enormous power which is placed in his hands for the production of absolutely clear glass and dense high lights, a power which, certainly so far as our present experience goes, does not exist in the use of gelatine dry plates. It is but very seldom, however, nowadays, among amateurs at least, that we find any of such conversant with collodion work, and hence the first question of importance for their consideration is: What is the most suitable class of gelatine plate to use as a substitute for collodion? When writing such articles as the one I am at present treating, it is at all times a very difficult thing for a writer to refrain from so expressing his opinion as to avoid referring to this or that particular maker's production, for trade interests are now so largely mixed up with what from time to time we see written about photography, that the moment any particular brand of plates, etc., is recommended, the natural inference is that So-and-so has some interest in recommending the particular article in question. I make this remark lest any of my readers should think that I have any other interest whatever save merely letting it be known to those who are anxious to know what, in my opinion, is the most suitable gelatine plate to employ when copying a black and white picture or printed matter. I have given a good deal of attention to this subject, and after an experience of some years I have no hesitation in saying that when collodion cannot be used, the next best plate for an amateur to employ is one coated with Mawson & Swan's lantern emulsion; in using such, however, the worker must work only his exposure by experience, and make such tally with the particular form of developer he is best acquainted with, and as a rule, when copying black and white, intensification should invariably be employed, but only after a most complete and thorough washing.

So much for copying black and white subjects, etc.

I now pass on to the consideration of photographing such articles as china, cut glass, medals, coins, and very many other articles of vertu, or even such commonplace articles as are to be met with in every day commerce, and which very frequently it is desired to copy, either with a view of making lantern slides for projection on the screen, or even, it may be, the mere pulling off of a silver print for the album or to send a friend.

I once met with a very enthusiastic worker who was a good deal given to bounce anent his knowledge of photography; in fact, he was what one sometimes hears termed a "new shutter man," and knew more about instantaneous photography in a drawing-room than he knew on a pier-head or a busy thoroughfare; and I well remember when

meeting him in this fashionable drawing-room, and he was shown a very valuable and chastely cut decanter, which was highly prized by the lady of the house, and on his being asked if he could make a photograph of it so as to show up the exquisite pattern, he immediately replied, "Only too delighted!" Now, I guess, so far as the showing up of the exquisite design is concerned, my friend did not feel so delighted, for he found he had undertaken a task which he really did not know how to execute, and I have frequently since, when speaking of such kind of work to amateurs, been struck by the apparent ease with which they consider such a bit of work is done, and hardly one in twenty knows how properly to set about it, so as to show off the pattern cut upon it.

Then, again, another very common thing is a piece of plate or silver cup; it seems so easy, but in reality but very few know properly how to set about it. And I have seen an old china plate give no end of trouble also.

Of course the question of primary importance here is the lighting, but there are also no end of other dodges which are of the utmost service to the photographer, and which once known stand him in good stead for all future time; and this dodging cannot really well be discarded, no matter whether the work has to be done with the aid of daylight or by artificial light. When copying such things as articles of vertu, in many cases I prefer to use artificial light to daylight, for with its aid the light is more under control, and with suitable appliances for holding the various articles *in situ* screens can be employed to diffuse the light, and other means employed whereby reflections are overcome quite as easily, if indeed in some cases not better, than is the case with daylight.

Of course another point of importance when photographing such articles is the employment of suitable backgrounds, but as a rule any worker of taste will find that the resources of most well appointed households will furnish him with all he requires to accomplish this work. In some cases I use transparent supports for holding the object *in situ*, while in others a deal board covered with black velvet will be found most useful.

• In my next I hope to refer more particularly to the photographing of such articles as cut glasses, decanters, coins, etc., by means of a similar mode of illumination as previously described by me for photographing book illustrations.

PHOTOGRAPHIC CHEMISTRY.

By R. Meldola, F.R.S., *Cantor Lectures at Society of Arts.*

(*Continued.*)

The photo-chemical studies which have been dwelt upon in the last lecture lead up to the consideration of the silver compounds, which must, of course, receive special treatment on account of their present importance in photographic processes. The broad facts, that silver nitrate darkens on exposure to light when in contact with organic matter, that the silver haloids become colored when exposed under suitable conditions, and that other salts of silver, both inorganic and organic, also darken on exposure, will form the experimental basis from which the student may be led to the further consideration of the subject. At the outset of this work, it is desirable to point out that our knowledge respecting the action of light on the silver compounds is in a different position to that concerning the simpler cases of photo-chemical decomposition which have hitherto been discussed. In the latter, the chemical change is definite enough to be represented by ordinary equations, the composition of the final product being, in most instances, known. In the case of silver salts we possess no such accurate knowledge, and the nature of the products is still surrounded by mystery.

When light falls on the silver haloids, chemical decomposition takes place, accompanied by a change in color. In order that this statement may be properly realized, let it be shown that there really is decomposition, and that the chloride and bromide under

these circumstances give off a gas which blues starch and potassium iodide paper.* The iodine does not undergo decomposition on exposure, except in the presence of an iodide absorbent, *i. e.*, a sensitizer. From these facts a good lesson can be conveyed concerning the general nature of the action of sensitizers. Passing on to the action of light on films of the haloids, it is possible, by means of a few simple experiments, to demonstrate many important properties of these compounds with which the student should be familiar. For this purpose, sheets of paper, well coated with the pure haloids free from excess of silver nitrate, and a few ordinary reagents, are the only requisites. By one operation it can be shown that with the same exposure the chloride becomes darker than the bromide, and the latter darker than the iodide, and at the same time that reducing agents and halogen absorbents accelerate, while oxidizing agents retard, the decomposition. Thus three strips, coated respectively with the three haloids, may be painted with stripes of solutions of (1) sodium nitrate, (2) sodium sulphite, (3) silver nitrate, (4) mercuric nitrate, (5) potassium dichromate. After exposing these strips simultaneously to the action of light, the stripes 1 and 2 will be darker than the ground color, showing the accelerating action of the reducing agents, 3 will also be darker than the ground color, showing that a halogen absorbent may also act as an accelerator without necessarily being a reducing agent, while 4 and 5 will retain the original color of the haloid, showing the retarding action of oxidizing agents. A comparison of the ground color in three strips will also serve to show the different colors of the products of photo-chemical decomposition.

Such demonstrations as these cannot fail to impress the mind that the action of light on the silver haloids is a distinct case of photo-chemical decomposition, but it is necessary at this stage to issue a caution. The action is in these cases continued up to the point of visible darkening, whereas in the photographic film the exposure is so short that no directly visible effect is produced. It must be enforced, therefore, that in associating the photographic image with these darkened products we are drawing largely upon arguments from analogy; and although I personally am inclined to the opinion that the products are the same in both cases, this view cannot be taught as a dogmatic truth in the present state of knowledge; for, however probable it may appear from analogy, it must not be forgotten that in the way of direct proof there is still a gap which must be bridged over before the identity of the products can be taught as an established fact. But the full consideration of this question is better deferred till the photographic film itself comes to be dealt with. The point that will now present itself is the actual composition of the darkened products; and here it may at once be pointed out to the student that our knowledge respecting these compounds is in precisely the same state as that concerning the colored haloids dealt with in the last lecture. In the case of the darkened chloride, it has been proved that this product contains a little less chlorine than the normal chloride. In all three haloids, no matter how long the exposure may be, the final product always contains an enormous excess of unaltered haloid. It may safely be asserted that these products are not chemical compounds in the ordinary acceptation of the term, since they are not composed of the haloid combined with the colored product of photo-chemical decomposition in definite molecular proportions.† Neither can the "photo-salts" be classed with the definite "molecular compounds" of modern chemistry, since the latter also consist of substances combined in definite molecular proportions, and can be more or less readily resolved into their constituent molecules by appropriate treatment. But the "photo-salt" cannot be resolved by any such treatment, since all solvents which dissolve the normal haloid appear to decompose the darkened product, leaving only a trace of metallic silver. On the other hand, metallic silver cannot be extracted from the "photo-salt" by any of the ordinary methods.

* "Chemistry of Photography," pp. 65, 66.

† It must be recognized that the definite character of molecular compounds passes into the indefinite when we have $\frac{1}{2}$ H_2O, $\frac{1}{2}$ $C_2H_4O_2$, $\frac{1}{2}$ CH_4O, etc., in crystalline products.

In answer to the question which the inquiring student would naturally put, What is the photo-salt? it can only be said that these products must be regarded as indefinite molecular compounds of the silver haloids, with colored, unstable products of photo-chemical decomposition, the composition of the latter being as yet unknown. That the colored products are unstable appears from the fact that they cannot exist apart from an excess of the normal haloid. In the same way that a solvent will take up a solid till the point of saturation is reached, so the silver haloid, on exposure to light, becomes decomposed up to a certain point, *i. e.*, the point when the haloid is saturated with the colored product of photo-decomposition.* Beyond this point the action of light produces no further effect, unless a reducing agent is present capable of combining with the liberated halogen as fast as the latter is liberated. It is advisable to let the student observe for himself that silver iodide, prepared with excess of potassium iodide, undergoes no change of color on exposure to light, but that, in the presence of silver nitrate or reducing agents, darkening occurs. Let him observe also that the darkened chloride yields no appreciable quantity of silver to dilute nitric acid, but that in the presence of a strong reducing agent, even when the latter is gaseous, such as hydrogen, the reduction may proceed up to the complete liberation of the metallic silver. This last point can be demonstrated very conveniently by placing some finely divided silver chloride (prepared by precipitation) into a glass tube, through which a current of moist hydrogen is kept passing, the gas being made to bubble through a solution of silver nitrate containing free nitric acid. On exposing the contents of the tube for some time to strong light, silver chloride is precipitated from the solution of the nitrate, the chloride in the tube (which should be shaken from time to time in order to expose fresh portions) gradually becoming dark colored. An equal quantity of the chloride may be exposed in air at the same time for comparison. The two lots of darkened chloride are then treated with equal quantities of dilute nitric acid, the clear solution filtered off, and the filtrates tested for silver. If the experiment has been properly conducted, the solution from the chloride darkened in hydrogen will be found to contain distinct traces, while that from the chloride darkened in air will be free from silver. It is hardly necessary to point out that the chloride used in this experiment should be free from excess of silver nitrate, *i. e.*, prepared with an excess of a soluble chloride, or chlorhydric acid.†

Having arrived at the conclusion that the silver haloids, when exposed to light

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* The analogy between a photo-salt and a saturated solution was indicated in a lecture delivered last year at the Royal Institution (*Proc. Roy. Inst.*, vol. xiii, p. 143). The idea of a "solid solution" may appear somewhat strained, and I am glad, therefore, of the present opportunity of calling attention to a similar idea which has occurred to others in connection with a totally different branch of chemistry, viz., the affinity of coloring matters for fabrics. This notion has been expressed by Dr. Enecht (*Jour. Soc. Dyers and Colorists*, 1889, p. 77), and recently it has been extended with considerable force to the theory of dyeing by my friend Dr. Otto N. Witt (*Färber-Zeitung*, 1890–91, part i).

† The above experiment is a modification of one described by Robert Hunt ("Researches on Light," second edition, page 78). This method has recently been applied by R. Hitchcock (*American Chemical Journal*, xi, page 474), for determining quantitatively the loss of weight in films of silver chloride, exposed to light in an atmosphere of hydrogen. The author considers that his experiments prove that oxygen does not enter into the composition of the darkened product, *i. e.*, that they disprove the oxychloride theory. But since water vapor was present, and was, indeed, found to be indispensable for the photo-decomposition, this inference cannot be allowed much weight. Moreover, since hydrogen is known to reduce the chloride to silver under the conditions of the experiment, the darkened product may have a different composition to that found in air; it may consist of reduced silver, mixed with unaltered chloride. (See also C. H. Bothamley, in *British Journal of Photography*, April 4, 1890.) Hitchcock's films were prepared by allowing finely divided silver chloride, obtained by precipitation, to subside on glass. (Herschel and Hunt's method.) After being washed and dried under a desiccator, the films were but slightly darkened in dry air, even after an hour's exposure to bright sunlight. The introduction of water rapidly increased the rate of darkening, thus furnishing another illustration of the very familiar fact that water acts as a sensitizer. This point was illustrated during the lecture by two experiments, conducted simultaneously. Strips of paper, coated with the chloride and bromide respectively, were partly screened by black paper, the exposed portions being partly wetted with distilled water. The chloride paper was allowed to remain exposed to the electric light till visibly colored; the bromide paper was withdrawn after a few seconds, and developed with weak ferrous oxalate developer. In both strips the portion wetted with water was distinctly darker than the exposed dry part of the coated paper.

under suitable conditions, lose a small quantity of their halogen, and become converted into colored compounds, the course of instruction will here naturally diverge along two lines:

(1) The nature of the colored product combined with the excess of unaltered haloid; and

(2) The part played by the associated substance or sensitizer.

(*To be continued.*)

PAINTED WITH SUNSHINE.

FREDERIC E. IVES' REPRODUCTION IN PHOTOGRAPHS OF THE COLORS OF NATURE.

A LARGE audience of ladies and gentlemen which crowded the hall of the Franklin Institute last evening heard a most interesting lecture by Mr. William Jennings, on the beauties and wonders of the Yellowstone region, and witnessed, thrown upon a screen, a fine collection of photographic views, in which Mr. Frederic E. Ives successfully reproduced the colors of nature. On August 9th last Mr. Ives and Mr. Jennings started from the Broad street station of the Pennsylvania Railroad, fully equipped with cameras for a four-thousand-mile journey, and they succeeded in capturing views of some of the grandest scenery in the country.

Mr. Ives, who was introduced by Professor Houston, said the greater portion of the illustrations shown were "snap shots" made by Mr. Jennings, and the pictures, he said, would do credit to the best photography. This assertion was strongly borne out by the enthusiasm of the appreciative audience. Mr. Ives also explained that he had remedied certain defects in his color camera, and he had been so successful in obtaining open landscapes and other views as to convince former skeptics of the possibility of making photographs in the colors of nature. The limelight used last evening, he said, was not powerful enough to bring out the sunlight illumination, but the effect produced was intermediate between moonlight and sunlight. The occasion, he said, was the first in the world in which an attempt was made to illustrate a lecture with photographic pictures in the natural colors, and before the close of the season he meant to demonstrate the success attained with a greater variety of subjects.

How complete has been his success the delightful plaudits of his audience last evening testified, as their eyes fastened on view after view revealing the gorgeous coloring of the Yellowstone Park scenery.

The picture is produced by making simultaneously three negatives, each one of which, to describe it in non-scientific terms, represents that part of the image produced by a particular color. The slide made is then projected on the screen through three lenses with colored glass screens, the three images being accurately focused one over the other so as to produce a sharp and accurate picture in the natural colors. Mr. Ives also showed how colored prints are produced on the same principle. Mr. Jennings described the journey in a very bright and clever style.—*From Philadelphia Papers, December 19th.*

TOMMY JONES: "Say, mister, I want to get a pair of gloves."

FURNISHER: "Kid gloves?"

TOMMY: "Naw, naw! What a' givin' us? Gloves for a grown person."

OUR TWO ILLUSTRATIONS.

THE frontispiece of this issue of the BULLETIN is a reduced copy of four of Mr. H. P. Robinson's charming studies that have made his name famous in two hemispheres. We need not call the attention of our readers to their merits ; these are apparent to all. If any one desires copies of the originals in full size, they should apply to our publishers. The reduced photogravures are presented to give an idea of the character of the subjects.

The second illustration is from a capital negative, by Mr. A. A. Knox, of New York, and shows what can be done with a lens that is rated second class, but when rightly used will accomplish some handsome work.

THE BULLETIN—ITS WORK IN 1891—ITS PLANS FOR 1892.

DURING the past year we have aimed to make the BULLETIN an accurate record of the photographic progress of the world. As may be seen by an examination of its well filled pages, every event of importance has received attention, often the first published in America. It is perhaps difficult to see how we could have done more; yet we have determined that the journal shall continue to deserve its well earned reputation as "the leading photographic magazine of America." To this end we have made arrangements for the coming year which will give our readers still more interest in the journal and commend it to a yet larger circle of subscribers.

In future the editors will, in addition to their present resources, have a further number of regular contributors on the paid staff of the BULLETIN. Among these we intend to include the following well known writers on photographic subjects, whose articles, written exclusively for this journal, will be eagerly looked for by all professional and amateur photographers :

Mr. H. P. Robinson, of Tunbridge Wells, England ;
Dr. F. Stolze, of Berlin, Germany ;
Professor C. H. Bothamley, of England ;
Dr. J. Gaedicke, of Berlin ;
Professor Alexander Lainer, of the Imperial Institute, Vienna ;
The Rev. F. C. Lambert, of England ;
Captain Eugene Himly, of Berlin ;
Professor R. Meldola, of the Finsbury Technical Institute, England ;
Mr. G. H. Croughton, of Rochester, N. Y. ;
Dr. Ellerslie Wallace, Jr., of Philadelphia ;
Mr. H. Harrison Suplee, of Philadelphia.

It will be seen from the above list of names that we shall endeavor to keep our many readers well posted upon all the various phases of photographic work, and that we are sparing no expense that will conduce to this end. The contributions from the above writers will embrace practical topics from the best known practical workers ; art topics from artists ; scientific discussions, and articles that will interest the amateur as well as the professional photographer.

In addition to the above we have yet another surprise for our readers. For some time past we have had regular correspondents both in Germany and England who have supplied us with special letters upon current topics in those

countries. We have now succeeded in arranging for a similar special "Letter from France," giving the latest news in both France and Belgium, and take great pleasure in announcing that M. LEON VIDAL, editor of the *Moniteur de la Photographie* of Paris will be our special correspondent.

When we look over the work of the BULLETIN for the past year, and note the contributions of Dr. H. W. Vogel, "Talbot Archer," Dr. J. J. Acworth, Professor W. K. Burton and many others, together with the articles from the editors and their staff, the reports of societies, the answers to correspondents, and when we further contemplate the prospectus for the coming year, which will include all these and much more as above stated, we are inclined to ask : What else can we do to make the BULLETIN useful to its many readers?

If you believe in the BULLETIN and its work, tell of it to your neighbor and friend, and get him to send his name for our subscription list before the new year begins, that he may not miss any of the good things it is sure to contain in every number.

THE PUBLISHERS.

SOME NEW LENSES.

WE hear from the laboratory of the world renowned optician, Carl Zeiss, of Jena, Germany, as follows :

For several years past the members of the scientific department of our optical works have been engaged in theoretically and practically investigating the possible means of improving photographic lenses afforded by the extensive material placed at the disposal of practical opticians by the glass works of Messrs. Schott & Co., of Jena.

These investigations have resulted in the construction of two new types of photographic lenses, viz., an anastigmatic doublet and a triplet, which essentially differ from all other lenses, and which, from the critique of numerous experts, are in several respects superior to any of the lenses hitherto constructed.

The lenses of either type are chromatically corrected for both the axial and extra-axial portions of the field; the photographic image is coincident with the visually focused image and both are of equal magnitude. The lenses are, therefore, free from difference of focus and chromatic difference of magnification.

They are spherically corrected for the aperture of the largest of the diaphragms supplied with each lens, and a sharp image is, therefore, obtainable even with this largest diaphragm. Focusing is, accordingly, not affected by interchange of diaphragms, and the plate may be focused with any diaphragm other than that which is to be actually employed during exposure.

In computing the formula particular attention has been paid to compensating, as far as possible, the evil effects arising from reflections. All the images due to reflection have successfully been brought into such positions as not to exercise any prejudicial influence on the "brilliancy" of the image. In this respect, the new doublets, as described below, are hardly inferior to single lenses, while the triplets compare, to say the least, favorably with the usual lenses consisting of only two separate lenses.

The "flare-spot" does not show itself with any of these lenses; it does not even appear when dazzling light enters the lens.

The glasses used for these lenses are, with the exception of the apochromatic triplet—which necessarily contains a light borate-flint exclusively—very colorless silicate glasses, and are, in a high degree, transparent to actinic rays. The lenses are, therefore, rapid in proportion to their effective aperture, and thus satisfy one of the great wishes of photographers, viz., combination of rapidity with depth of focus.

Both types of lenses are patented in Germany, Great Britain, France, Austria, Hungary, Italy, Switzerland and the United States.

We have been informed that the manufacture of these lenses for America has been given to a prominent American firm of opticians, and we look forward to the price lists and the samples with much curiosity.

ANTHONY'S
Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,

Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,

and a corps of practical assistants.

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HIAWATHA CAMERA CLUB.

THE first annual meeting of the Hiawatha Camera Club was held December 1, 1891, and following officers elected: President, Dr. M. G. Jennison; Vice-President, Prof. J. W. Bell; Secretary, C. A. Hoffman, 2715 Second avenue So.; Treasurer, Geo. B. Eustis. Executive Committee: Dr. Twitchell, A. L. Eidemiller, Miss F. N. Stanchfield.

A paper was read by Prof. W. X. Sudduth, on Micro photography, which contained very many valuable points of interest.

This was followed by a paper on the "Objects of Camera Clubs" by Dr. Twitchell, and was well received and very instructive. It was voted to use the lantern as much as possible in all discussions, to illustrate subjects of papers, etc.

The first Tuesday of each month was voted as regular meeting evening for the following year.

The club contains quite a large number of ladies and scientific men, and the programme for following year is expected to be especially interesting, as the Executive Committee and officers are wide awake to the interest of the club.

Very respectfully,

C. A. HOFFMAN.

NEW YORK CAMERA CLUB.

THE Monday night lectures of the Camera Club are becoming quite famous, and a goodly audience of some of the best known local workers can always be relied upon. Monday, December 7th, proved to be no exception to this rule, for the room was filled to its utmost capacity with an audience whose close attention to the subject under discussion was manifested by the repeated applause accorded the lecturer, Mr. Wallace Goold Levison.

The subject, "Instantaneous Photography as an aid to Science, History and Art," offered plenty of scope, and in the short time at Mr. Levison's disposal a comprehensive general idea of the many striking advantages arising from the use of photography in the various professions was conveyed in a lucid and most interesting manner. By no means the least attractive feature was the collection of slides used, these having been chosen with consummate skill, and in every case conveying at once that which the lecturer desired to impress.

Mr. David Williams presided, and after a short introduction, Mr. Levison took the stand, the electric lights went out and the intellectual treat began.

Referring briefly to the work of Becquerel and Lippmann in the direction of color photography, Mr. Levison said that we might well be proud of what has been achieved in photography in black and white, and especially in instantaneous photography. After proving that there was no such thing as a really instantaneous exposure or shutter, the method of ascertaining the speed of shutters by the vibration of a tuning fork was explained. Proceeding to the aid photography affords science, the lecturer dealt fully upon its application to astronomy and the advantage the astronomer has in that the effect of light on the plate is cumulative. Slides showing a portion of the sky in which the constellation of the Swan is situated, first as seen through the telescope, and secondly as recorded by the photographic plate, fully confirmed the lecturer's statement; other slides of the sun's surface showing sun-spots and faculæ, and of the moon's surface, demonstrated the immense value of photography to the astronomer. To the medical profession, too, photography is fast becoming indispensable, and views of the larynx taken when normal and when diseased were sufficient evidence of this fact.

As for history, the photograph is an unfailing and unerring record of things as they are, and the aid it here affords is indisputable.

To illustrate the aid afforded to art, the photographs taken to form the basis of several well known pictures were thrown on the screen and were followed by a slide of the pictures produced. Several slides were shown in this connection which were of great merit and it was much regretted that their stay in the lantern was curtailed by lack of time. A thoroughly interested audience followed the lecturer through every step of his argument, and the hearty vote of thanks to Mr. Levison must have assured him that his efforts had not been in vain, but that he had dismissed an audience who had been deeply impressed, and who would in future realize that photography was playing a part in the arts and sciences second to none.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE rooms of this society are a veritable picture gallery, the exhibit from the American Institute Fair having been moved there, in addition to several large uranium toned bromides. The society is in a flourishing condition, and the rooms are probably the best equipped, and, what is more important, the best kept, in the country.

The stated monthly meeting was held on Tuesday, December 8th, Professor Stebbins occupying the chair.

Dr. Ehrmann exhibited on behalf of Mr. John Carbutt two pictures taken upon Carbutt flexible films and made with a panoramic camera. They were made on color-sensitive films with a Ross lens of 15 inches focus in a Moessard panoramic camera. The length of the picture was 48 inches, and Mr. Carbutt hoped soon to get a film of larger size, some 75 inches or even longer. The angle included was said to be 165 degrees. The pictures were perfectly sharp, being made with the lens working at *f*/64.

Mr. F. C. Beach exhibited a magazine hand camera somewhat on the style of the Turnover. Pulling a lever allows the plate to fall, the exposure is made, the camera inverted, and the lever again pulled to allow the plate to regain its first position.

The subject for the evening was a talk on "Lantern Slide Making" by Mr. William M. Murray. In opening Mr. Murray said that the idea of the committee was that some one should each year give a talk on the making of lantern slides, so that novices might be instructed in the method of procedure. No argument in favor of lantern slides was necessary, and he hoped to induce many present to forsake their habit of merely looking on at the efforts of others and to stimulate them to become producers. He would confine himself to the dry plate process as being that most suitable for members. The first point made was with regard to size. Most of the slides which had come under his notice were too large. The size of plate used is 3¼ by 4 inches.

Years ago glass stereos were made, and these being cut probably gave rise to the size 3¼ inches square, the usual English size. In America the length had been increased to 4 inches, thus offering only one chance for mistake in insertion into the lantern, as against three with the former size. This size, too, allows of plenty of room for the label and for the thumb mark. The opening in carrier used is 2¾ inches high and 2⅞ inches wide, and this is the conventional size of the mat. In reducing negatives he recommended to always reduce by the longest dimension. Thus an 8 x 10 negative, reduced to the size of the mat, suffers a reduction to two-sevenths.

To obtain the slides Mr. Murray pointed out that two methods may be employed, contact and through the camera. The latter method was preferable, as by its means any part of the negative, or the whole of it, may be embraced. A simple apparatus for the production of slides by copying through the camera was drawn on the blackboard and served to convince members that no expensive outfit was necessary. The brand of plate to be employed was left to the choice of the audience, the merits of each being touched upon. For a developer he had found nothing better than the old Piffard developer.

Hydroquinone..........	100 grains.
Sodium sulphite........	400 "
Potassium carbonate....	300 "
Water.................	20 ounces.

Speaking of exposure and development, Mr. Murray recommended a generous exposure and a liberal development. The half tones must be zealously preserved and opacity in the shadows avoided. The development must advance without a halt, as fog may ensue during any change. The method of local reduction with potassium ferricyanide was explained. For the fixing bath he recommended hypo and some clearing agent, such as acid sulphite of soda.

With some slides he had made a year or so ago, he had been troubled with the appearance of moisture between the glasses. This he thought might be due to the film not being

thoroughly dry at the time of mounting. With his recent slides he had adopted the precaution of warming gently both slide and cover slip, but they had not been made long enough yet for him to ascertain whether he had overcome the evil.

At the close of his talk a hearty vote of thanks was accorded Mr. Murray.

Mr. Burton announced that the medals awarded at the American Institute Fair would be presented at the next meeting.

The meeting adjourned at 10.15.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE monthly meeting of this section was held December 1st, Mr. Henry J. Newton presiding.

At the close of the regular routine business, Mr. A. D. Fisk exhibited a cylinder for the storage of gases for use with the limelight lantern. This cylinder contained oxygen, and was but one-quarter the size of the cylinders generally used for this purpose. The size of the one exhibited was 20 inches length by 4 inches for the width, with a capacity of 25 cubic feet. The pressure of the gas was estimated at 1,800 pounds to the square inch, and a steady delivery at 3 pounds pressure could be obtained until the exhaustion of the cylinder.

The lantern exhibition, the feature of the evening, was an unqualified success. Mr. Fisk was in charge, and slides from negatives made by New York and Brooklyn amateurs were thrown on the screen.

A series by A. J. Wright, of the United States Eclipse Expedition to Africa, were of great interest. The Kimberley diamond mines and several slides illustrative of native dress and customs were very much appreciated.

Another set by D. F. Seaver, of Brooklyn, illustrated a trip across the United States, including views in Yellowstone Park, the Canadian Central Park, and typical scenes of Indian life in the Far West.

Willis Dodge's collection was from subjects nearer home, showing pretty bits on Lake George, and other views from negatives made in New York State.

A. M. Clark is to be congratulated on having commenced a series of slides which will be of greater value as time goes on. His collection was a set of slides showing the changes going on now in New York and Brooklyn, a sort of "ancient and modern" collection. For example, the streets of Brooklyn, Fulton Street and others, as they appeared before the erection of the Elevated Railroad, as contrasted with their present appearance, presented a striking example of the ravages the march of civilization permits and commits.

Dr. Ehrmann exhibited a few slides toned with uranium salts, uranium nitrate, potassium ferricyanide and glacial acetic acid being used in a way similar to that used in the toning of bromide prints. These were very much admired. Some negatives by the same gentleman, developed with the new developer, para-amidophenol, were also shown, their characteristic being the intensity of the blacks and the great transparency in the clear parts.

The meeting adjourned at about 10 o'clock, to meet again January 5th.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. *Correspondents will please remember this. No attention will be paid to anonymous communications.*

Q.—W. M. writes: Will you kindly tell in your column devoted to answering questions how I can overcome the bother I have and have had for a long time past with my blotters. In silvering my N. P. A. paper (I use no other), I draw the sheet over the end of the dish and then pass it between blotting paper. And there is the trouble. For two or three sheets, or perhaps the first time I use it, the blotter will absorb the solution. But the next time I silver I find the blotter will not work at all even, sometimes not at all, and it leaves the silvered paper covered with streaks very much like "tear drops." I have tried various kinds of blotters, but find only once in a while one that is a good absorbent. Are others bothered in this same way? And can you help me any? If so, I will be your debtor.

A.—We do not quite understand your trouble. It may be that your blotters contain some kind of sizing that is coagulated by the silver nitrate. If you will send us a sample of your blotters before and after use we will test them and try to help you out of your trouble.

Q.—T. J. A. writes: Please answer in the next BULLETIN this question: Is there any difference in the time of exposure of a Cramer B plate or any other of the same sensitiveness when placed at, say, 6 feet from center of lens

to object and 1 foot from center of lens to ground glass; and the reverse, that is, 1 foot from the object and 6 feet to the ground glass?

A.—The answer to this question depends on the angle of the lens used. Another point is the question of light falling on the subject in each case. If the subject is in the same light in each case it will take thirty-six times the exposure time at 6 feet from the lens as it does at 1 foot from the lens. In the other case, and using the same lens, the same proportion would hold good, the size of the plate remaining the same. The law of light is that the intensity of light varies inversely as the square of the distance from its source.

Q.—L. R. G., Jr., writes: I purchased an outfit some time ago, and am anxious to try making dry plates of a slow emulsion, but am puzzled as to the *drying* of them. I find a box especially fitted for the purpose is necessary. Can you suggest a form suitable or give me a rough sketch of one? Is an ordinary case, light-tight, and containing chloride calcium (dry), suited to the purpose?

A.—There is no better book for the methods of making dry plates than Dr. Eder's "Modern Dry Plates," published by the proprietors of the BULLETIN, in which all the necessary directions are given in detail. As to the question of drying, all that is necessary is a light-tight box that can be heated from below, and is at the same time ventilated to carry off the moisture without letting in the light.

Q.—S. & R. write: We have considerable trouble in timing bromide prints, owing to variation of light and intensity of negatives. And we want to know if there is any device used by which one can calculate the required time. Or can the "Photometer for Timing Negatives" be used to an advantage?

A.—We have used Ballard's actinometer for timing negatives with decided success. If this instrument is used with care and discretion, we believe it would be just the thing for bromide enlargements. In your case, set the negative up and allow the light passing through it to fall onto a sheet of paper, and examine this light reflected from the paper by using the Ballard actinometer. Now, use your judgment as to time, and expose a piece of bromide paper and develop. If this is right, note the time called for by the actinometer, and use this as a guide for other exposures. If you have found once the right time for any particular paper, you can tell the exposure for any other occasion on that paper.

Views Caught with the Drop Shutter.

STUBER BROS., the well known photographers of Louisville, Ky., have a large force of men at work building a new dry plate factory in that city. THE STUBER DRY PLATE COMPANY will produce a new kind of dry plate for the use of photographers in this new factory.

SIMPKINSON & MILLER, of Cincinnati, write us: "We very much regret to be obliged to inform you, that in consequence of a fire at our establishment on last Saturday night, December 12th, we are compelled to seek other quarters. Temporarily and for the present we are located at 173 W. 5th street, near Elm. We expect to be able to return to our former place of business, No. 166 Race street, within a very short time.

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